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***SONOMA COUNTY LIBRARY***

**PETALUMA REGIONAL  
LIBRARY RENOVATION**

Bid Date: June 18<sup>th</sup>, 2024

Project No.: #7204 PETR

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DOCUMENT 000101

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**PROJECT MANUAL**  
Volume 1

**PETALUMA BRANCH LIBRARY RENOVATION**

**SONOMA COUNTY LIBRARY**

**Bid Date: June 18<sup>th</sup>, 2024**  
**Project Number: #7204 PETR**

**Advertisement Date: June 3<sup>rd</sup>, 2024**

**PROJECT TEAM**

**SONOMA COUNTY LIBRARY'S REPRESENTATIVE**

Dave Tichiva  
6135 State Farm Drive  
Rohnert Park, CA 94928  
(707)545-0831 x 1584 – Representative's Phone  
dtichava@sonomalibrary.org

**PROJECT ARCHITECT**

Noll & Tam Architects  
729 Heinz Avenue #7  
Berkeley, CA 93710  
(510) 542-2200

**STRUCTURAL ENGINEER**

ZFA Structural Engineers, Inc  
1212 Fourth St. Suite Z  
Santa Rosa, CA 95404  
(707) 526-0992

**MECHANICAL/ELECTRICAL ENGINEER**

Guttman & Blaevoet  
2351 Powell Street  
San Francisco, CA 94133  
(415) 655-4000

**CIVIL ENGINEER**

CSW/Stuber-Stroeh Engineering Group, Inc  
504 Redwood Blvd, Suite 310  
Novato, CA 94947  
(415) 883-9850

**FIRE PROTECTION ENGINEER**

Interface Engineering  
135 Main St, Suite 400  
San Francisco, CA 94105  
(415) 489-7240

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**SEALS PAGE**

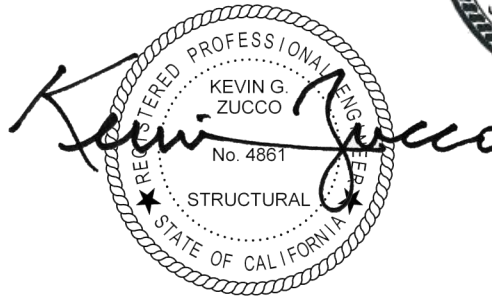
SONOMA COUNTY LIBRARY

Architect: Christopher Noll  
License No.: C15916  
Expires: 12/31/2023

Civil Engineer: Kristine Pillsbury  
License No.: 61685  
Expires:



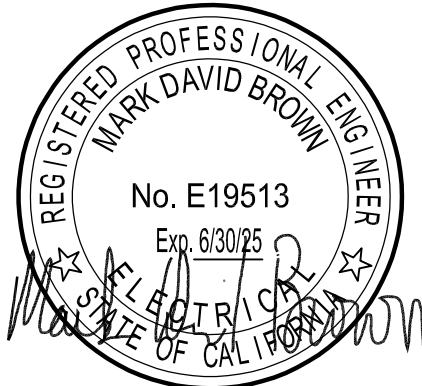
Structural Engineer: Kevin Zucco  
License No.: 4861  
Expires:



Mechanical Engineer: Tunde Munz  
License No.: M032924  
Expires: 9/30/24



Electrical Engineer: Mark David Brown  
License No.: E19513  
Expires: 6/30/25



Fire Protection Engineer: Kenton J. Aikens  
License No.: 1689  
Expires:



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**(NOT USED)**

**END OF SECTION**

**INVITATION TO BID**

- 1.1 NOTICE.** The SONOMA COUNTY LIBRARY (“Library”) hereby gives notice that it will accept Bids for construction of the following public work:

SONOMA COUNTY LIBRARY  
PETALUMA REGIONAL LIBRARY RENOVATION

- 1.2 BID SUBMISSION.** Library will receive sealed Bids at Sonoma County Library until 3:00 p.m. PST on June 18<sup>th</sup>, 2024. The opening will be in accordance with procedures set forth in Document 002113 (Instructions to Bidders). Bidders shall refer to Document 002113 (Instructions to Bidders) for required documents and items to be submitted in a sealed envelope.

- 1.3 CONTACT INFORMATION.**

Mailing address:  
Sonoma County Library  
6135 State Farm Drive  
Rohnert Park, CA 94928

Project Manager:  
David Tichava  
Sonoma County Library Facilities Manager  
6135 State Farm Drive  
Rohnert Park, CA 94928  
Phone: (707) 545-0831, ext. 1584  
Email: dtichava@sonomalibrary.org

- 1.4 DESCRIPTION AND LOCATION OF THE WORK.** The Work consists of construction of the Library’s Petaluma Branch Library Renovation Project, at 100 Fairgrounds Drive, Petaluma, California (the “Project”). The Project Work includes, but is not limited to, the construction of renovations to the interior and exterior of the Petaluma Library Branch.

- 1.5 CONTRACT TIME.** Substantial Completion shall be within 334 Days from the date when work is to commence as stated in the Notice to Proceed. Final Completion shall be within 365 Days from the date when work is to commence as stated in the Notice to Proceed.

- 1.6 REQUIRED CONTRACTOR’S LICENSE(S).** A California Class B General Contracting License is required to Bid this Contract and through the completion of the project. All contractors and subcontractors shall be properly licensed by the Contractor’s State Licensing Board and possess the necessary license classifications for the work they perform under this project.

- 1.7 REGISTRATION PURSUANT TO LABOR CODE SECTION 1723.5 REQUIRED.** All Contractors submitting a bid proposal for this Project, and any Subcontractors listed therein, must be currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. The Library requires proof of current registration by contractor and all listed subcontractors as a condition to bid on this project, subject only to the allowances of Labor Code section 1771.1.

- 1.8 PREVAILING WAGE LAWS.** This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents.

Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract are on file at the Library’s Headquarters located at 6135 State Farm Drive, Rohnert Park, California, and are also available on the website of the State of California Department of Industrial Relations, at the following link: <https://www.dir.ca.gov/Public-Works/Prevailing-Wage.html>. Upon request, the Library will make copies available to any interested party. Contractor shall post the applicable prevailing

wage rates at the Site, in addition to all other job site notices prescribed by regulation.

- 1.9 SUBSTITUTION OF SECURITIES.** Library will permit successful Bidder to substitute securities for retention monies withheld to ensure performance of Contract, as set forth in Document 00680 (Escrow Agreement for Security Deposits in Lieu of Retention), in accordance with California Public Contract Code, Section 22300. By this reference, Document 00680 (Escrow Agreement for Security Deposits in Lieu of Retention) is incorporated in full in this Document 001116 (Invitation to Bid).
- 1.10 MANDATORY PRE-BID CONFERENCE AND SITE VISIT.** Library will conduct a Pre-Bid Conference at 8:30 AM on June 10<sup>th</sup>, 2024, at 100 Fairgrounds Drive, Petaluma, CA 94592, to generally discuss Project scope, to consider such matters as Bidders may request and for a Site Visit immediately following, at the Site. Bidders must attend Pre-Bid Conference and Site Visit and sign an attendance roster as a condition to bidding. The Pre-Bid Conference and Site Visit will last approximately 3 hours.
- 1.11 PROCUREMENT OF BIDDING DOCUMENTS.** Bidders may obtain Bidding Documents by electronically only via the Sonoma County Library website <https://sonomalibrary.org/about/contracting-opportunities> .
- 1.12 BID PREPARATION COST.** Bidders are solely responsible for the cost of preparing their Bids.
- 1.13 RESERVATION OF RIGHTS.** Library specifically reserves the right, in its sole discretion, to reject any or all Bids, or re-bid, or to waive inconsequential deviations from Bid requirements.
- 1.14 ESTIMATED BASE BID CONSTRUCTION COST.** The estimated base bid construction cost is \$ (excludes estimated cost of alternates).

END OF DOCUMENT

**INSTRUCTIONS TO BIDDERS**

Bids are requested for a construction contract, or work described in general, as follows:

SONOMA COUNTY LIBRARY  
PETALUMA REGIONAL LIBRARY RENOVATION

**1.1 RECEIPT OF BIDS.** Refer to Document 001116 (Invitation to Bid), paragraph 1.2, for location, day and time for submittal of bids. The Library will accept Bids only from Bidders duly licensed in accordance with the California Business & Professions Code and in accordance with paragraph 1.6 of Document 001116 (Invitation to Bid). The Library will receive Bids in an opaque sealed 10" x 13" envelope containing the respective items described in paragraph 1.5 below. All Bid envelopes will be time-stamped to reflect their submittal time. The Library will reject all Bids received after the specified time and will return such Bids to Bidders unopened. Bidders must submit Bids in accordance with this Document 002113.

**1.2 CONTACT INFORMATION.** Refer to Document 001116 (Invitation to Bid), paragraph 1.3.

**1.3 MANDATORY PRE-BID CONFERENCE.** The Library will conduct a mandatory Pre-Bid Conference at the time and location identified in paragraph 1.10 of Document 001116 (Invitation to Bid), to generally discuss project scope, to consider such matters as Bidders may request. Bidders must attend Pre-Bid Conference and sign an attendance roster as a condition to bidding. The Pre-Bid Conference will last approximately 3 hour(s).

The Pre-Bid Site Visit will not provide an opportunity for Bidders to have questions answered, but will be merely a showing of the site and existing conditions. The Library will transmit to all parties recorded as having received Bidding Documents such Addenda as the Library in its discretion considers necessary in response to written questions. Bidders shall not rely on oral statements. Oral statements will not be binding or legally effective.

The Library, in its sole discretion, may elect to conduct additional Pre-Bid Conference and Site Visits. Notice of any Site Visits shall be given through addendum to the Bidders.

Bidders can arrange, subject to Project Manager's advance approval of a written workplan, a date and time to investigate conditions or otherwise conduct invasive investigations, explorations, tests, or studies, subject to delivering an executed Document 002613 (Indemnity and Release Agreement) and providing an insurance certificate as described therein by noon of the day prior to the scheduled site visit.

**1.4 BID SUBMISSION.** Bidder should mark its Bid envelope as BID FOR THE SONOMA COUNTY LIBRARY, PETALUMA REGIONAL LIBRARY RENOVATION. Bids shall be deemed to include the written responses by the Bidder to any questions or requests for information by the Library made as part of Bid evaluation process after submission of Bid. Bidder's failure to submit all required documents strictly as required entitles the Library to reject the Bid as non-responsive.

**1.5 CONTENTS OF ENVELOPE - BID PRICE.** Bid envelope shall include:

- A. Document 004113 (Bid Form – Stipulated Sum - Single-Prime Contract) completed in accordance with paragraph 1.6 of this Document 002113.
- B. Bid security supplied completed in accordance with paragraph 1.7 of this Document 002113.
- C. Document 004336 (Proposed Subcontractors Form) in accordance with paragraph 1.8 of this Document 002113.
- D. Document 004513 (Bidder Registration and Safety Experience Form)
- E. Document 004519 (Non-Collusion Affidavit).



- 1.6 REQUIRED BID FORMS.** All Bidders must submit Bids using, where applicable, documents supplied in this Project Manual, including without limitation the documents listed above, in accordance with the instructions contained in those documents. The Library will reject as non-responsive any Bid not submitted on the required forms. Bids must be full and complete. Bidders must complete all Bid items and supply all information required by Bidding Documents. The Library reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Bidders may not modify the Bid Form or qualify their Bids. Bidders must submit clearly and distinctly written Bids. Bidders must clearly make any changes in their Bids by crossing out original entries, entering new entries, and initialing new entries. The Library reserves the right to reject any Bid not clearly written.
- 1.7 REQUIRED BID SECURITY.** Bidders must submit with their Bids either cash, a cashier's check or certified check from a responsible bank in the United States, or a bidder's bond executed by an admitted surety insurer. The amount of the security shall be not less than ten percent (10%) of amount of the total Bid Price, indicated on Document 004113 (Bid Form), payable to "Sonoma County Library". All Bidders choosing to submit a bidder's bond must submit it on the required form, Document 004313 (Bid Security Forms). The Library will reject as non-responsive any Bid submitted without the necessary Bid security.
- The Library may retain Bid security of other than the Apparent Low Bidder for a period of 60 Days after award or until full execution of the Contract, whichever first occurs. Upon full execution of the Contract, and upon request by Bidder, the Library will return to the respective unsuccessful Bidders their Bid securities and Bid bonds.
- 1.8 REQUIRED SUBCONTRACTORS LIST.** All Bidders must submit with their Bids the required information in Document 004336 (Proposed Subcontractors Form) for those Subcontractors who will perform any portion of Work, including labor, rendering of service, or fabricating and installing a portion of the Work, in excess of one half of one percent of total Bid. Violation of this requirement may result in Bid being deemed non-responsive and not being considered.
- 1.9 REGISTRATION PURSUANT TO LABOR CODE SECTION 1725.5 REQUIRED.** As of March 1, 2015, all Contractors and Subcontractors who will perform any portion of the Work must be currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. Library required proof of current registration by Bidder and all Subcontractors listed on Document 00430 as a condition to bid on this project, subject only to the allowances of Labor Code section 1771.1.
- 1.10 OTHER REQUIREMENTS PRIOR TO BIDDING.** Submission of Bid signifies Bidder's careful examination of Bidding Documents and complete understanding of the nature, extent, and location of Work to be performed. As a condition to Bidding, Bidder must complete tasks listed in Document 005213 (Agreement Form), Article 5. Submission of Bid shall constitute Bidder's express representation to Library that Bidder has fully completed these tasks.
- 1.11 EXISTING CONDITIONS INFORMATION.** Bidders may examine any available existing conditions information (e.g., record documents, specifications, studies, drawings of previous work, geotechnical data) by giving the Library reasonable advance notice. Document 003119 (Existing Conditions Information) [others in 0031xx series] applies to all supplied existing conditions information and all other information supplied regarding existing conditions either above ground or below ground.
- 1.12 ADDENDA.** Bidders must direct all questions about the meaning or intent of Bidding Documents to the Library (to the attention of the Project Manager identified in Document 001116, Invitation to Bid, paragraph 1.3) in writing. Interpretations or clarifications considered necessary by the Library in response to such questions will be issued by Addenda mailed, faxed, or delivered to all parties recorded by the Library as having received Bidding Documents. Addenda will be written and will be issued to each Bidder to the address or fax number supplied to Library by Bidder. The Library may not answer questions received less than seven (7) Days prior to the date for opening Bids. Only questions answered by formal

written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

- A. Addenda may also be issued to modify the Bidding Documents as deemed advisable by the Library.
- B. Addenda shall be acknowledged by number with signature in Document 004113 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from the Library.

**1.13 SUBSTITUTIONS.** Bidders must base their Bids on products and systems specified in Contract Documents or listed by name in Addenda.

- A. Except as provided in paragraph 1.13.D below, the Library will consider substitution requests only for “or equal items.” Bidders wanting to use “or equal” item(s) must submit Document 002600 (Procurement Substitution Request Form) no later than 14 Days prior to submitting their Bids. After that date, the Library will not accept “or equal” substitution requests. To assess “or equal” acceptability of product or system, submittals of substitutions shall contain the information required in Document 020600 (Procurement Substitution Request Form) and set forth in Section 016000 (Product Requirements). Insufficient information will be grounds for rejection of substitution. The Library shall, within a reasonable period of time after having received a Request for Substitution, issue in writing its decision as to whether the proposed substitute item is an Equal item. The Library’s decision shall be conclusive on all Bidders.
- B. Approved substitutions shall be listed in Addenda and become part of Contract Documents.
- C. Substitutions may be requested after submitting Bids and Award of Contract only in accordance with requirements specified in Section 016000 (Product Requirements).
- D. As further limitation on Bidder’s privilege to substitute items, the Library has found that certain items are designated as Library standards and certain items are designated to match existing items in use on a particular public improvement, either completed or in the course of completion, or are available from only one source. As to such items, the Library will not permit substitution.

**1.14 WAGE RATES.** Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at the Library’s Headquarters located at 6135 State Farm Drive, Rohnert Park, California (see also <https://www.dir.ca.gov/Public-Works/Prevailing-Wage.html>), and are deemed included in the Bidding Documents. Upon request, the Library will make copies available to any interested party. Contractor shall post the applicable prevailing wage rates at the Site.

**1.15 EQUAL EMPLOYMENT OPPORTUNITY.** Contractor shall comply with all applicable federal, state, and local laws, rules, and regulations in regard to nondiscrimination in employment because of race, color, ancestry, national origin, religion, sex, marital status, age, medical conditions, disability, or any other reason.

**1.16 WITHDRAWAL OF BIDS.** Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 002113, only by written request for the withdrawal of Bid filed with the Purchasing Agent. Bidder or its duly authorized representative shall execute request to withdraw Bid. The submission of a Bid does not commit the Library to award a contract for the Project, to pay costs incurred in the preparation of a Bid, or to procure or contract for any goods or services.

**1.17 BID OPENING.** The Library will open all Bidders’ Bid envelopes promptly following the deadline for receiving Bids specified in Document 001116 (Invitation to Bid), Paragraph 1.2, initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein.

**1.18 DETERMINATION OF APPARENT LOW BIDDER.**

- A. The Library will determine Apparent Low Bidder in accordance with Public Contract Code Section 20103.8(b), taking into account all alternates (if any) included in the Total Bid

Price as calculated in Document 004113 (Bid Form). See Section 012300, Alternates, for a list of all alternates.

- B. The Library reserves the right to add to or deduct from the Contract any of the additive or deductive items after the lowest responsible bidder has been determined following the Contract award.

**1.19 BID EVALUATION.** The Library may reject any or all Bids and waive any informalities or minor irregularities in the Bids. The Library also reserves the right, in its discretion, to reject any or all Bids and to re-Bid the Project. The Library reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if the Library believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Library. For purposes of this paragraph, an “unbalanced Bid” is one having nominal prices for some Bid items and enhanced prices for other Bid items.

- A. In evaluating Bids, the Library will consider Bidders’ qualifications, whether or not the Bids comply with the prescribed requirements, unit prices, and other data, as may be requested in Document 004113 (Bid Form) or prior to the Notice of Award.
- B. In order to evaluate Bidder’s ability to perform and provide the Work in accordance with the Contract Documents to the Library’s satisfaction within the prescribed time, the Library may conduct reasonable investigations and reference checks of Bidder, proposed Subcontractors, suppliers and other persons and organizations as the Library deems necessary to assist in the evaluation of any Bid and to establish Bidder’s responsibility, qualifications, financial ability, proposed Subcontractors, suppliers, and other persons and organizations. Submission of a Bid constitutes Bidder’s consent to the foregoing. The Library shall have the right to consider information provided by sources other than Bidder. The Library shall also have the right to communicate directly with Bidder’s surety regarding Bidder’s bonds.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.
- D. Quantities stated in the Bidding Documents are approximate only and are subject to correction upon final measurement of the Work, and are subject further to the rights reserved by the Library to increase or diminish the amount of work under any classification as advantages to design or construction needs require.
- E. The Library may determine whether a Bidder is qualified in its sole discretionary judgment.

**1.20 BID PROTEST.** Any Bid protest must be submitted in writing to the Sonoma County Library, Library Director, at 6135 State Farm Drive Rohnert Park, CA 94928, within seven (7) calendar days following posting of Document 005050 (Notice of Intent to Award for Construction). Document 005050 (Notice of Intent to Award for Construction) will be posted at the Library’s Headquarters located at 6135 State Farm Drive Rohnert Park, California. The Library will use reasonable efforts to deliver by facsimile a copy of Document 005050 (Notice of Intent to Award for Construction) to all Bidders who submitted Bids no later than the Business Day after issuance, although any delay or failure to do so will not extend the Bid protest deadline described above. All bid protests must comply with the Library’s Bid Protest Procedures, available on its website at the following link: [https://sonomalibrary.org/sites/default/files/attachments/Policies\\_and\\_Procedures/2019\\_05\\_06\\_Purchasing\\_Policy\\_Incorporates\\_Bid\\_Process\\_Policy.pdf](https://sonomalibrary.org/sites/default/files/attachments/Policies_and_Procedures/2019_05_06_Purchasing_Policy_Incorporates_Bid_Process_Policy.pdf). In addition, the following requirements apply:

- A. The initial protest document must contain a complete statement of the basis for the protest and must demonstrate that the protestor has a direct economic interest in the bid award.
- B. The protest must refer to the specific portion of the document that forms the basis for the protest.

- C. The protest must include the name, address, and telephone number of the person representing the protesting party.
  - D. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
  - E. The procedure and time limits set forth in this paragraph are mandatory and are the sole and exclusive remedy in the event of Bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Party may not rely on a protest submitted by another Party, but must timely pursue its own protest.
- 1.21 AWARD.** If the Contract is to be awarded, it will be awarded to the lowest responsible Bidder. Following completion of all required Library procedures and receipt of all Library approvals, Library will issue Document 005100 (Notice of Award) to successful Bidder.
- 1.22 POST-NOTICE OF AWARD REQUIREMENTS.** After Notice of Award, the successful Bidder must execute and submit the following documents as indicated below.
- A. Submit the following documents to the Library by 5:00 p.m. of the fourteenth (14<sup>th</sup>) Day following Notice of Award (Document 005100). Execution of Contract by Library depends upon approval of these documents:
    - 1) Document 005213 (Agreement Form – Stipulated Sum): To be executed by successful Bidder. Submit two (2) originals, each bearing an original signature on the signature page and initials on each page.
    - 2) Document 006113.13 (Performance Bond Form): To be executed by successful Bidder and surety, in the amount set forth in Document 006113.13 (Performance Bond Form). Submit one original.
    - 3) Document 0062113.16 (Payment Bond Form): To be executed by successful Bidder and surety, in the amount set forth in Document 0062113.16 (Payment Bond Form). Submit one original.
    - 4) Insurance certificates and endorsements required by Document 007200 (General Conditions) Article 4. Submit one original set.
    - 5) Document 006536 (Warranty Form). To be executed by successful Bidder. Submit one original, bearing an original signature.
  - B. The Library shall have the right to communicate directly with Apparent Low Bidder's proposed performance bond surety, to confirm the performance bond. The Library may elect to extend the time to receive faithful performance and labor and material payment bonds.
  - C. Successful Bidder's failure to submit the documents required herein, in a proper and timely manner, entitles Library to rescind its award, and to cause Bidder's Bid security to be forfeited as provided herein.
- 1.23 FAILURE TO EXECUTE AND DELIVER DOCUMENTS.** If Bidder to whom Contract is awarded shall, within the period described in paragraph 1.22A of this Document 002113, fail or neglect to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, the Library may, in its sole discretion, foreclose on Bidder's surety bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract. Bidder agrees that calculating the damages Library may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of Library's damages. In addition, upon such failure, Library may determine the next Apparent Low Bidder and proceed accordingly.
- 1.24 MODIFICATION OF COMMENCEMENT OF WORK.** The Library expressly reserves the right to modify the Commencement Date in the Notice to Proceed under the Contract and to independently perform and complete work related to the Project. To the fullest extent

permitted by law, the Library accepts no responsibility to Contractor for damages attributed to Library's need to complete additional work at the site.

**1.25 PUBLIC RECORDS ACT REQUESTS.**

- A. Per the Public Records Act, the Library will make available to the public all correspondence and written questions submitted during the Bid period, all Bid submissions opened in accordance with the procedures of this Document 002113, and all subsequent Bid evaluation information. Except as otherwise required by law, the Library will not disclose trade secrets or proprietary financial information submitted that has been designated confidential by Bidder. Any such trade secrets or proprietary financial information that a Bidder believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections shall not be permitted and shall be invalid. The specific information must be clearly identified as such.
- B. Upon a request for records regarding this Bid, the Library will notify Bidder involved within ten (10) days from receipt of the request of a specific time when the records will be made available for inspection. If the Bidder timely identifies any "proprietary, trade secret, or confidential commercial or financial" information that Bidder determines is not subject to public disclosure, and requests Library to refuse to comply with the records request, Bidder shall take all appropriate legal action and defend Library's refusal to produce the information in all forums; otherwise, Library will make such information available to the extent required by applicable law, without restriction.
- C. Information disclosed in the Bid and attendant submissions are the property of the Library unless Bidder makes specific reference to data that is considered proprietary. Subject to the requirements in the Public Records Act, reasonable efforts will be made to prevent the disclosure of information except on a need-to-know basis during the evaluation process.

**1.26 CONFORMED PROJECT MANUAL AND CONSTRUCTION DRAWINGS.** Following Award of Contract, the Library may prepare a conformed Project Manual reflecting Addenda issued during bidding, which will, failing objection, constitute the approved Project Manual.

**1.27 DEFINITIONS.** All abbreviations and definitions of terms used in this Document 002113 are set forth in Document 007200 (General Conditions) and Section 014200 (References).

END OF DOCUMENT

**PROCUREMENT SUBSTITUTION REQUEST FORM**

To: **David Tichava, Facilities Manager, Sonoma County Library**

Email: **dtichava@sonomalibrary.org; tmd@ridge-cm.com**

Project: **Petaluma Regional Library Renovation Project**

Contractor: \_\_\_\_\_

Subcontractor/Supplier: \_\_\_\_\_

Drawing Sheet Reference/Detail No: \_\_\_\_\_

Specification Section: \_\_\_\_\_

The undersigned Bidder submits for consideration the following equipment instead of the specified item for the above Project:

<u>Section</u>	<u>Paragraph</u>	<u>Specified Item</u>
_____	_____	_____
_____	_____	_____

Proposed Substitution: \_\_\_\_\_

The undersigned encloses the information required herein. If this Document 002600 is being submitted by a Bidder wishing to use "equal" item(s) as provided in Document 001116 (Instructions to Bidders), the undersigned Bidder must also enclose the technical information (other than cost) otherwise required for a post-Award of Contract Request for Substitution ("RFS") under Section 016000 (Product Requirements). However, if this Document 002600 is being submitted under provisions of Contract Documents after Award of Contract, the undersigned Contractor must include all information (including cost) required under Section 016000 (Product Requirements).

The undersigned has (a) attached manufacturer's literature, including complete technical data and laboratory test results, if applicable, (b) attached an explanation of why proposed substitution is a true equivalent to specified item, (c) included complete information on changes to Contract Documents that the proposed substitution will require for its proper installation, and (d) filled in the blanks below:

A. Does the substitution affect dimensions shown on Drawings?

---

B. Are the manufacturer's guarantees and warranties on the proposed substitution items identical to those on the specified items? If there are differences, please specify each and every difference in detail.

---

C. What effect does the substitution have on other contractors, trades, or suppliers?

---

D. What are the differences between the proposed substitution and the specified item? If proposed substitution has a color or pattern, provide a color board showing proposed substitution in relation to the other adjacent colors and patterns.

---

E. Will granting the requested substitution cause any schedule delay? (If yes, please explain)

---

The undersigned Bidder certifies that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item.

Submitted by:

For Use by Library:

\_\_\_\_\_

\_\_\_\_ Accepted

\_\_\_\_ Accepted as Noted

Bidder/Contractor

[note applicable]

\_\_\_\_ Not Accepted

\_\_\_\_ Received Too Late

\_\_\_\_\_

By: \_\_\_\_\_

Signature

Library's Project Manager

\_\_\_\_\_

Date: \_\_\_\_\_

Name

Reviewed

\_\_\_\_\_

By: \_\_\_\_\_

Address

Project Manager's Supervisor

\_\_\_\_\_

Date: \_\_\_\_\_

City/State/Zip



Telephone: \_\_\_\_\_

Remarks: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

END OF DOCUMENT

**INDEMNITY AND RELEASE AGREEMENT**

Dated \_\_\_\_\_

POTENTIAL BIDDER: \_\_\_\_\_

LIBRARY: SONOMA COUNTY LIBRARY

SITE: \_\_\_\_\_

PROJECT: PETALUMA REGIONAL LIBRARY RENOVATION

In consideration of the above-referenced Library's permitting the undersigned potential bidder ("Bidder") to have access to, and to conduct investigations, tests and/or inspections on, the Site, Bidder hereby agrees as follows:

1. To the greatest extent permitted by law, Bidder hereby releases, and shall defend, indemnify and hold harmless the Library, and its officers, employees, consultants, representatives, and agents, and all other parties having any other interest in the Site, against any claim or liability, including attorney's fees, arising from or relating to any Site-related access, investigation, test, inspection and/or other activity conducted by Bidder or any of Bidder's officers, employees, consultants, representatives, and/or agents, regardless of whether claim or liability is caused in part by the negligence of Library or by any released and indemnified party.
2. Bidder hereby waives the provisions of California Civil Code Section 1542 which provides as follows:  

A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with the debtor.
3. Bidder shall repair any damage to the Site or adjacent property resulting from activities authorized hereunder, and comply with and be subject to all other requirements and obligations described or referenced in Document 003119 (Existing Conditions Information).

4. Attached hereto (or to be delivered separately before Bidder's visit to the Site) is a certificate for comprehensive general liability insurance satisfying the requirements of Document 007200 (General Conditions).
5. Although this Indemnity and Release Agreement is not a Contract Document (see Document 005213 [Agreement]), it shall be fully effective and binding regardless of whether Bidder submits a Bid for the Project, is awarded a contract for the Project, or otherwise.

\_\_\_\_\_  
Name of Bidder

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature

Its: \_\_\_\_\_  
Title (If Corporation: Chairman, President  
or Vice President)

Its: \_\_\_\_\_  
Title (If Corporation: Secretary, Assistant  
Secretary, Chief Financial Officer or  
Assistant Treasurer)

END OF DOCUMENT

## EXISTING CONDITION INFORMATION

### 1.1 SUMMARY

- A. This Document 003119 sets forth the terms and conditions under which Bidder may review, study, use, or rely upon existing conditions information, including geotechnical data if applicable, concerning existing conditions at or contiguous to the Site. This Document 003119, the available geotechnical data, and the supplied existing conditions information are not Contract Documents.

### 1.2 REPORTS AND INFORMATION

- A. Existence of Reports. The Library, its consultants, and prior contractors may have collected documents providing a general description of the Site and conditions of the Work. These documents may consist of geotechnical reports for and around the Site, contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding Underground Facilities. These reports, documents and other information are not part of the Contract Documents.
- B. Inspection of Reports. Bidders may inspect reports and information regarding existing conditions available at the Facilities Development and Management Division, and may obtain copies upon Bidder's payment for the costs of reproduction and handling. These reports, documents and other information, are not part of the Contract Documents. Nevertheless, by submitting a Bid, Bidder accepts full responsibility for reviewing, knowing and understanding the contents of all of these materials.
- C. Inclusion in Project Manual. Geotechnical reports and information regarding existing conditions may also be included in the Project Manual, but neither shall be considered part of the Contract Documents.
- D. Existing Conditions Information. The following geotechnical reports and data, and information regarding existing conditions and Underground Facilities at or contiguous to the Site, are available for review through the Library:
- Petaluma Library Drawings- 1974
  - Meeting Room Expansion Drawing – 2003
  - Restroom Remodel Drawings

### 1.3 USE OF INFORMATION ON EXISTING CONDITIONS

- A. Aboveground Existing Conditions. Under no circumstances shall the Library be deemed to make a warranty or representation of existing aboveground conditions, as-built conditions, or other aboveground actual conditions verifiable by reasonable independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform prior to bidding and Bidder must not rely on the information supplied by the Library regarding existing conditions. Bidder represents and agrees that in submitting its Bid, it is not relying on any information regarding existing conditions supplied by the Library.
- B. Underground Facilities. Information supplied regarding existing Underground Facilities at or contiguous to the Site is based on information furnished to Library by others (e.g., the builders of such Underground Facilities or others). Except as expressly set forth in this Document 003119, the Library does not assume responsibility for the accuracy, completeness or thoroughness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information. Except as expressly set forth in this Document 003119, the Library will be responsible only for the general accuracy of information regarding Underground Facilities, and only for those Underground Facilities that are owned by the Library. This express assumption of responsibility applies only if Bidder has conducted the independent investigation required of it and discrepancies were not apparent.

#### **1.4 LIMITED RELIANCE PERMITTED ON CERTAIN INFORMATION**

- A. Geotechnical Data. Except as expressly set forth in this Document 003119, the Library does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data. Bidder represents and agrees that in submitting its Bid, it is not relying on any geotechnical data supplied by the Library, except as specifically set forth herein.
- B. Technical Data. Bidder may rely upon the general accuracy of the “technical data” contained in the geotechnical reports and existing conditions information identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required of it and discrepancies were not apparent. The term “technical data” in the referenced reports and drawings shall be limited as follows:
  - 1) The term “technical data” shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment, or structures that were encountered during subsurface exploration.
  - 2) The term “technical data” does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.

- 3) The term “technical data” shall not include the location of Underground Facilities.
- 4) Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the “technical data” contained in such reports or drawings.
- 5) Bidder is solely responsible for any interpretation or conclusion drawn from any “technical data” or any other data, interpretations, opinions, or information contained in supplied existing conditions information.

## **1.5 INVESTIGATIONS**

- A. Before submitting a Bid, each Bidder shall be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents. Bidders shall advise the Library in writing as limited by Section 1.11 of Document 002113 (Instructions to Bidders) of any questions, suppositions, inferences or deductions Bidders may have for Library’s review and response.
- B. The Library has provided time in the period prior to bidding for Bidder to perform these investigations.
- C. Notwithstanding the foregoing, hazardous materials investigations shall only be conducted by the Library as provided in Document 003126 (Existing Hazardous Materials Information).

END OF DOCUMENT

## **EXISTING HAZARDOUS MATERIALS INFORMATION**

### **1.1 SUMMARY**

- A. This Document 003126 describes certain hazardous material surveys and use of data therein.

### **1.2 REPORTS AND INFORMATION**

- A. The Library have prepared documents providing a general description of the Site and locations of hazardous materials subject to the Work. These documents consist of surveys included in or with this Project Manual, or made available for review and copying. The surveys are the following:
  - 1) Hazmat survey
- B. Bidders may inspect such surveys at the Library's Headquarters located at 6135 Rohnert Park, California, and copies may be obtained at cost of reproduction and handling upon Bidder's payment for the costs. These surveys are not part of the Contract Documents.

### **1.3 USE OF DATA AND INFORMATION**

- A. Data and information regarding the locations of hazardous materials are not part of Contract Documents. Bidders may rely on this data and information for general accuracy regarding the locations of potentially hazardous materials subject of the Work.
- B. The Library does not warrant and makes no representation regarding the completeness or thoroughness of any data or information regarding existing conditions or hazardous materials, including, but not limited to, quantities, characteristics, volumes, or associated structural features. Bidder represents and agrees that in submitting a Bid it is not relying on any such data, information or deductions.

### **1.4 INVESTIGATIONS**

- A. Before submitting a Bid, each Bidder shall be responsible for requesting the Library to obtain such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning hazardous materials matters. Bidders must provide the Library with sufficiently advance notice for the Library to determine whether the examination, etc. is warranted and, if so, to perform the

examination, etc. Such examinations, etc. shall be performed only by the Library or its consultants; Bidders shall not perform them.

- B. The Library has provided time in the period prior to bidding to perform these investigations.
- C. Any Library decision taken in good faith regarding these matters shall be conclusive and binding.

END OF DOCUMENT



**BID FORM (STIPULATED SUM – SINGLE PRIME CONTRACT)**

To be submitted by the time and date specified in Document 001116 (Invitation to Bid), paragraph 1.2.

TO THE SONOMA COUNTY LIBRARY

THIS BID IS SUBMITTED BY:

---

(Firm/Company Name)

Re: PETALUMA REGIONAL LIBRARY RENOVATION

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the Sonoma County Library, a California Joint Powers Authority entity (“Library”), in the form included in the Contract Documents, Document 005213 (Agreement Form – Stipulated-Sum), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Contract Documents, Document 001116 (Invitation to Bid), and Document 002113 (Instructions to Bidders), including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 90 Days after the day of Bid opening.
3. In submitting this Bid, Bidder represents:

- (a) Bidder has examined all of the Contract Documents and the following Addenda (receipt of all of which is hereby acknowledged).

Addendum Number	Addendum Date	Signature of Bidder

- (b) Bidder has visited the Site and performed all tasks, research, investigation, reviews, examinations, and analysis and given notices, regarding the Project and the Site, as set forth in Document 005213 (Agreement Form – Stipulated-Sum), Article 5.

- (c) Bidder has given the Library prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and as-built drawings and actual conditions and the written resolution thereof through Addenda issued by the Library is acceptable to Contractor.

4. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sums of money listed in the following Schedules:

SCHEDULE OF BID PRICES

All Bid items, including lump sums and unit prices, must be filled in completely. Bid items are described in Section 011000 (Summary). Quote in figures only, unless words are specifically requested.

ITEM	DESCRIPTION	TOTAL LUMP SUM

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>TOTAL LUMP SUM</b>
1.	Base Bid	\$
2.	Add Alternate #1	\$
3.	Add Alternate #2	\$
4.	Add Alternate #3	
5.	Deduct Alternate #1	
6.	Deduct Alternate #2	
<b>TOTAL BID PRICE*</b>		\$

\*Basis to determine apparent low bid.

Total Bid Price: The sum total of base bid plus add alternate 1,2,3 and deduct alternate 1 and 2.

(Words)

SCHEDULE OF OTHER LISTED ALTERNATES (OPTIONAL)

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>TOTAL LUMP SUM</b>
1.	Alternate #	\$
2.	Alternate #	\$

SCHEDULE OF UNIT PRICES

The following Unit Prices shall apply to Work covered by unit prices, regardless of quantity. By submitting a Bid, Bidder acknowledges that these unit prices shall remain fixed throughout performance of the Contract, regardless of any incremental cost

differentials resulting from variances in any quantity estimates or increased or decreased economies of scale.

ITEM	DESCRIPTION	UNIT OF MEASURE	ITEM PRICE PER UNIT OF MEASURE (IN FIGURES)
1.			\$
2.			\$
3.			\$

5. Subcontractors for work included in all Bid items are listed on the attached Document 004366 (Proposed Subcontractors Form).
  
6. The undersigned Bidder understands that the Library reserves the right to reject this Bid.
  
7. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the undersigned Bidder within the time described in paragraph 2 of this Document 004113 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Document 002113 (Instructions to Bidders) within the times specified therein.
  
8. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.
  
9. The undersigned Bidder herewith encloses either a cashier’s check, or certified check from a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do surety business in the State of California, in form specified in Document 00200 (Instructions to Bidders), in the amount of ten percent (10%) of the Total Bid Price contained above and made payable to “Sonoma County Library.”
  
10. The undersigned Bidder agrees to commence Work under the Contract Documents on the date to be established in Document 005500 (Notice to Proceed) and to complete all work within the time specified in Document 005213 (Agreement Form). The undersigned Bidder acknowledges that the Library has reserved the right to delay or modify the commencement date after issuance of Document 005500 (Notice to Proceed). The

undersigned Bidder further acknowledges the Library has reserved the right to perform independent work at the Site, the extent of such work may not be determined until after the opening of the Bids, and that the undersigned Bidder will be required to cooperate with such other work in accordance with the requirements of the Contract Documents.

- 11. The undersigned Bidder agrees that, in accordance with Document 007200 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Document 005213 (Agreement Form) shall be as set forth in Document 005213 (Agreement Form).
  
- 12. **IMPORTANT NOTICE:** If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full.

**NAME OF BIDDER:** \_\_\_\_\_

licensed in accordance with an act for the registration of Contractors, and with license number: # \_\_\_\_\_ Expiration: \_\_\_\_\_.

\_\_\_\_\_  
Where incorporated, if applicable

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Principals

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

\_\_\_\_\_  
Signature of Bidder

NOTE: If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

Business Address:

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Contractor's Authorized Representative(s), (name, title):

---

---

Officers authorized to sign contracts:

---

---

---

Telephone Number(s):

---

Fax Number(s):

---

Date of Bid:

---

END OF DOCUMENT

**BID SECURITY FORMS**

KNOW ALL BY THESE PRESENTS:

That the undersigned \_\_\_\_\_ [Name of Contractor] as Principal and the undersigned as Surety are held and firmly bound unto the SONOMA COUNTY LIBRARY, a California Joint Powers Authority entity ("Library"), as obligee, in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) lawful money of the United States of America being ten percent (10%) of the aggregate amount of said Principal \_\_\_\_\_'s Total Bid Price (as identified in Principal's Bid), for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a Bid for the Sonoma County Library, Petaluma Regional Library Renovation Project.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Bid submitted by the said Principal be accepted and the Contract be awarded to said Principal and said Principal shall within the required periods enter into the Contract so awarded and provide the required Construction Performance Bond, Construction Labor and Material Payment Bond, insurance certificates, and all other endorsements, forms, and documents required under Document 002113 (Instructions to Bidders), then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bound parties have executed this instrument this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

(Corporate Seal)

By

\_\_\_\_\_  
Principal

(Corporate Seal)

---

Surety

By

---

Attorney in Fact

END OF DOCUMENT



**PROPOSED SUBCONTRACTORS FORM**

Bidder submits the following information as to the subcontractors Bidder intends to employ if awarded the Contract.

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

Full Name of Subcontractor and Location (City & State) of Mill or Shop	Subcontractor DIR	Description of Work	Subcontractor's License No.*


(Bidder to attach additional sheets if necessary)

\*Subcontractor license number can be submitted up to twenty-four (24) hours after the bid opening.

END OF DOCUMENT

**STATEMENT OF QUALIFICATIONS (SOQ) FOR CONSTRUCTION WORK**

**1.1 REQUIRED CONTENTS OF SOQ SUBMISSION**

(Provide the requested information in the precise order that it is listed)

- A. Attachment "A" Statement of Qualifications Questionnaire. Fill out the questionnaire completely. If additional pages are required to adequately explain an entry, include them at the end of the attachment.
- B. Litigation History. Description of litigation history for the past ten years, including names of involved parties, nature of dispute, and disposition.
- C. Capability to Provide Required Performance and Payment Bonds. Bidder shall include a letter from a surety duly licensed to do business in the State of California, having a financial rating from A. M. Best Company of A or better, that the surety has agreed to provide Bidder with the required performance and payment bonds in accordance with the requirements set forth in Documents 006113.13 (Performance Bond Form) and 006113.16 (Payment Bond Form). Such performance and payment bonds shall be in the minimum penal sums provided therein. Bidder shall include authorization that gives the Library the right to verify with the surety that the surety, based upon the Bid prices, will issue the required bonds under the conditions stated.
- D. Financial Capacity. Include audited or reviewed financial statements for the three most recently completed fiscal years for Bidder. Also include audited or reviewed financial statements for the three most recently completed fiscal years for any parent company(ies) of Bidder (if applicable).
- E. Human and Physical Resources. Bidder shall identify, describe, and quantify for itself and separately for its “designated Subcontractor(s)” (as defined in Document 00200 Instructions to Bidders), the following technical resources for the Work:
  - 1) Description and location of manufacturing facilities, naming products and quantifying production capacity and current demand;
  - 2) Description of field organization(s), naming skills and equipment;
  - 3) Description of safety program, quality control procedures, and safety experience; and

- 4) Evidence of a valid California contractor's license and required licenses of all persons who are Key Personnel of the Bidder or any designated Subcontractor.
- F. Resumes of Proposed Key Personnel. Bidder shall provide a resume for each named Key Personnel of Bidder (only list the personnel that would be assigned to this specific project, including but not limited to the Project Manager, Superintendent, and Scheduler) and Bidder's designated Subcontractor(s), to include the following:
- 1) Name and proposed assignment of Key Personnel - do not include home addresses or phone numbers;
  - 2) Years of experience;
  - 3) Education - degrees, schools, and years obtained;
  - 4) Professional license or registration(s);
  - 5) Fluency in English (Yes/No);
  - 6) Experience directly related to above proposed assignment;
  - 7) At least two client references, including contact names, addresses, and telephone numbers; and
  - 8) Description of two projects of a similar nature worked on in the past five years.
- G. Description of Project Scheduling Experience and Sample CPM Schedule. Provide a description of Bidder's experience with scheduling construction activities and using Primavera project planner. Provide resumes (in paragraph "F" above) for proposed personnel or consultants and a description of their experience with scheduling construction activities and Primavera project planner. Submit a draft Initial CPM Schedule meeting the requirements of the Contract Documents for the Initial CPM Schedule (see Section 01320.1.4), which shall be time scaled, have preliminary resource loading, and showing a draft plan for proposed Work to be completed in the first sixty (60) days of the contract. In addition to the above minimum requirements, the draft schedule may include cost loading and a detailed plan for the proposed Work in the first sixty (60) days of the contract.
- H. Management Plan. Bidder shall submit a Management Plan as specified herein. The proposed Management Plan shall be described in sufficient detail to fully understand how Bidder plans to manage and coordinate the Work of manufacture, construction, installation, testing and commissioning, including but not limited to coordination with the Library, governmental authorities, suppliers, subcontractors, insurers, shippers, inspection agencies, and contractors for related work, all to ensure smooth project operation. The Management Plan shall contain at least the following:

1. Organization Chart: Bidder shall develop and propose an organization chart. The chart shall show the overall organization of member firms and subcontractors, their roles/responsibilities and how the management for each member firm will report within and to its firm's executive management. Bidder must provide a discussion of how each member's project manager will obtain technical and financial support and resources.
2. Organization Chart shall include the specific people that will be assigned to each position. Provide resumes for all people as part of paragraph "F" above.

## **1.2 GENERAL CONDITIONS**

- A. General Conditions for Content. The SOQ shall be clear and concise to enable Staff to make a thorough evaluation and arrive at a sound determination as to whether the SOQ meets the Library's requirements. To this end, the SOQ should be so specific, detailed, and complete as to demonstrate clearly and fully that the Bidder has a thorough understanding of and has demonstrated knowledge of the requirements to perform the Work.
- B. Explanations to SOQ. Any explanation requested by a Bidder regarding the meaning or interpretation of this Document 004500 must be requested in writing in accordance with Document 002113 (Instructions to Bidders). Oral explanations or instructions will not be binding. Any information provided to any prospective Bidder concerning this Document 004500 will be furnished to all prospective Bidders as an Addendum to the Bidding Documents.

## **1.3 DEFINITIONS**

- A. Except as set forth herein, all abbreviations and definitions of terms used in this Document 004500 are as set forth in Document 007200 (General Conditions) or Section 014200 (References).

**ATTACHMENT "A" -- STATEMENT OF QUALIFICATION QUESTIONNAIRE FOLLOWS ON FOLLOWING PAGES**

**ATTACHMENT "A" -- Statement of Qualification Questionnaire**

Bidders shall complete the entire Statement of Qualification Questionnaire and submit it in accordance with Document 002113 (Instructions to Bidders) and this Document 004500. Failure to complete the questionnaire or inclusion of any false statement(s) shall be grounds for immediate disqualification.

**I. CONTACT INFORMATION**

Bidder's Name: \_\_\_\_\_

Bidder's Legal Organization:

Corporation \_\_\_\_\_ Partnership \_\_\_\_\_ Sole Proprietorship \_\_\_\_\_ Joint Venture\* \_\_\_\_\_

Name of President, Managing Partner, or Owner: \_\_\_\_\_

Bidder's Address: \_\_\_\_\_

Bidder's Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Contact's Phone (include extension): \_\_\_\_\_

Contact's E-mail (if different): \_\_\_\_\_

\*If a joint venture, provide all of the requested information for each member of the joint venture.

**II. GENERAL INFORMATION**

Complete Part II before proceeding.

- 1. Does Bidder possess a valid and current California Contractor’s license for the Work proposed? Yes \_\_\_\_\_ No \_\_\_\_\_
- 2. Has Bidder’s license been revoked at any time in the last five years? Yes \_\_\_\_\_ No \_\_\_\_\_
- 3. Has Bidder changed names or license numbers in the past 10 years? If so, state reason for change on an additional page. Yes \_\_\_\_\_ No \_\_\_\_\_
- 4. Does Bidder have a minimum of \$2,000,000 general liability insurance coverage? Yes \_\_\_\_\_ No \_\_\_\_\_
- 5. Has Bidder been “default terminated” by an owner (other than for convenience), or has a Surety completed a contract for Bidder within the last five years? Yes \_\_\_\_\_ No \_\_\_\_\_
- 6. Has Bidder been cited more than twice for failure to pay prevailing wages in the last five years? Yes \_\_\_\_\_ No \_\_\_\_\_
- 7. Has Bidder attached copies of its reviewed or audited financial statements and accompanying notes for the latest three years? Yes \_\_\_\_\_ No \_\_\_\_\_

**Bidder will be immediately disqualified if any answer to questions 1, 4 or 7 is No.**

**Bidder will be immediately disqualified if any answer to questions 2, 5 or 6 is Yes.**

**PART III. SAFETY**

- 1. Has Cal/OSHA, Federal OSHA, the EPA or any Air Quality Management District cited Bidder in the past five years? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, attach description of each citation.

2. How often does Bidder require documented safety meetings be held for:

Field Supervisor	Weekly ____	Bi-weekly ____	Monthly ____	Less than monthly ____
Employees	Weekly ____	Bi-weekly ____	Monthly ____	Less than monthly ____
New Hires	Weekly ____	Bi-weekly ____	Monthly ____	Less than monthly ____
Subcontractors		Weekly ____	Bi-weekly ____	Monthly ____

3. How often does Bidder conduct documented safety inspections?

Quarterly \_\_\_\_ Semi-annually \_\_\_\_ Annually \_\_\_\_ Other \_\_\_\_

4. Does Bidder have home office safety representatives who visit/audit the job site?

Yes \_\_\_\_ No \_\_\_\_ If yes, how often?

Quarterly \_\_\_\_ Semi-annually \_\_\_\_ Annually \_\_\_\_ Other \_\_\_\_

5. What is Bidder's Intrastate Experience Modification Rate? \_\_\_\_\_.

**Bidder will be immediately disqualified if the answer to this question 5 is greater than 1.0.**

#### **PART IV. DISPUTES**

Has Bidder had any claims, litigation, or disputes ending in mediation or arbitration, or termination

for cause associated with any project in the past 10 years? If yes, attach description of each such

instance including details of total claim amount, settlement amount, and owner's name and phone

number.

Yes \_\_\_\_ No \_\_\_\_



**PART V. BONDING**

Bonding Capacity - Provide documentation from Bidder's surety identifying the following:

1. Name of bonding company/surety
2. Name of Surety Agent
3. Surety Agent address and telephone number
4. Is surety a California-admitted surety? Yes \_\_\_\_\_ No \_\_\_\_\_
5. Is surety listed in the current edition of the California Department of the Treasury's Listing of approved sureties? Yes \_\_\_\_\_ No \_\_\_\_\_
6. List surety's A.M. Best Rating
7. Give Bidder's bonding capacity per job and aggregate.
8. What percentage rate does Bidder pay for bonds?

**PART VI. FINANCIAL INFORMATION**

1. Has Bidder ever reorganized under the protection of the bankruptcy laws?  
Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, please state when \_\_\_\_\_
2. If Bidder has had the general liability carrier identified in Document 004513 (Bidder Registration and Safety Experience Form) for less than 5 years, please provide additional information below for balance of the past 5 years.

Agency Name: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Carrier: \_\_\_\_\_ Dates: \_\_\_\_\_ A.M. Best Rating: \_\_

Carrier: \_\_\_\_\_ Dates: \_\_\_\_\_ A.M. Best Rating: \_\_

Carrier: \_\_\_\_\_ Dates: \_\_\_\_\_ A.M. Best Rating: \_\_

3. Has Bidder ever had insurance terminated by a carrier? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, explain on separate signed sheet marked with correlating cross-reference to this paragraph of the questionnaire.

## **PART VII EXPERIENCE OF BIDDER**

The unique nature of this Project requires prior similar experience of the Bidder and the Key Personnel assigned. Provide the detailed project information requested in the format provided below (attach additional pages if necessary):

### **Prime Contractor.**

- 1) List three (3) projects with a construction cost of at least \$5,000,000 each, completed in the past ten years.

Project Name: \_\_\_\_\_

Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Owner Contact (name and phone number): \_\_\_\_\_

Architect or Engineer: \_\_\_\_\_

Architect or Engineer Contact (name and phone number): \_\_\_\_\_

Project Mgr.: \_\_\_\_\_

Project Superintendent: \_\_\_\_\_

Project Scheduler: \_\_\_\_\_

Description of Project, Scope of Work Performed: \_\_\_\_\_

---

Total Construction Cost:\_\_\_\_\_

Total Change Order Amount:\_\_\_\_\_

Original Scheduled Date of Completion:\_\_\_\_\_

Time Extensions Granted (number of Days):\_\_\_\_\_

Actual Date of Completion:\_\_\_\_\_

Number of Stop Notices filed by subcontractors or suppliers:\_\_\_\_\_

NOTE: All references listed above should have correct and current telephone numbers.  
Bidder is advised to confirm the listing of a reference before including them.

Bidder hereby declares under penalty of perjury that all the information provided in this questionnaire is true and correct.

---

SIGNATURE

---

TITLE

END OF DOCUMENT

**BIDDER REGISTRATION AND SAFETY EXPERIENCE FORM**

INSTRUCTIONS

**INDEPENDENT CONTRACTOR REGISTRATION**

Contractor's License # \_\_\_\_\_

Date: \_\_\_\_\_ Fed I.D. # \_\_\_\_\_

Full Corporate Name of Company:

\_\_\_\_\_

Street Address: \_\_\_\_\_

\_\_\_\_\_

Mailing Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Name of Principal Contact: \_\_\_\_\_

Type of Business:                    \_\_\_\_\_ Sole Proprietor                    \_\_\_\_\_ Partnership  
  
   \_\_\_\_\_ Non-Profit 501 C3                    \_\_\_\_\_ Corporation  
  
   \_\_\_\_\_ other (please explain: \_\_\_\_\_ )

## SENATE BILL 854 COMPLIANCE

The California Legislature imposed a registration requirement for contractors and subcontractors involved in public works projects. Senate Bill 854 created a registration program, which went into effect on July 1, 2014, to fund the California Department of Industrial Relations' (DIR's) monitoring and enforcement of prevailing wage laws. The bill requires public agencies to include notice of the registration requirement in their bid invitations and bid documents

Contractors and subcontractors wishing to work on a public works project must be registered with the DIR. Registration and related information is available at the following DIR website link:  
<https://www.dir.ca.gov/Public-Works/Contractor-Registration.html>.

Contractor's Public Works Contractor Registration (PWCR) Affidavit # \_\_\_\_\_

Classification or Type of Worker (Carpenter, Plumber, etc.) that will be employed by the Contractor(s):

---

---

Listing of Sub-Contractors

Contractor Lic. No.	DIR #	Contractor	Classification of Workers

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Contractors are also subject to penalties for bidding or working on public works without being registered with DIR. However, contractors will not be in violation for working on a private job that is later determined to be public work.

Contractors and subcontractors on all public works projects are also required to submit certified payroll records to the Labor Commissioner, unless excused from this requirement.

**INSURANCE**

**Workers' Compensation:**

Carrier: \_\_\_\_\_

Address: \_\_\_\_\_

Phone and Fax: \_\_\_\_\_

Policy Number: \_\_\_\_\_

**General Liability:**

Carrier: \_\_\_\_\_

Address: \_\_\_\_\_

Phone and Fax: \_\_\_\_\_

Policy Number: \_\_\_\_\_

Policy Limits: \$ \_\_\_\_\_

A.M. Best Rating: \_\_\_\_\_



**Automobile Liability:**

Carrier: \_\_\_\_\_

Address: \_\_\_\_\_

Phone and Fax: \_\_\_\_\_

Policy Number: \_\_\_\_\_

Policy Limits: \$ \_\_\_\_\_

A.M. Best Rating: \_\_\_\_\_

## SAFETY EXPERIENCE

The following statements as to safety experience of Bidder are submitted with Bid, as part thereof, and Bidder guarantees the truthfulness and accuracy of the information.

1. List Bidder's Interstate Experience Modification Rate for the last three years.

2016: \_\_\_\_\_

2017: \_\_\_\_\_

2018: \_\_\_\_\_

2. Use Bidder's last year's Cal/OSHA 300 log to fill in the following:

a. Number of lost workday cases \_\_\_\_\_

b. Number of medical treatment cases \_\_\_\_\_

c. Number of fatalities \_\_\_\_\_

3. Employee hours worked last year \_\_\_\_\_

4. State the name of Bidder's safety engineer/manager or Site Safety Officer:

\_\_\_\_\_

Attach a resume or outline of this individual's safety and health qualifications and experience.

BIDDER CERTIFIES, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND AUTHORIZES THE COUNTY OF SONOMA, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

---

SIGNATURE

---

DATE

END OF DOCUMENT

**NON-COLLUSION AFFIDAVIT**

PUBLIC CONTRACT CODE §7106

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

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid.  
[Office of Declarant] [Name of Bidder]

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, and 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.

Petaluma Regional Library Renovation

**Non-Collusion Affidavit**

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].

\_\_\_\_\_  
Name of Declarant (Please Print)

\_\_\_\_\_  
Signature of Declarant

END OF DOCUMENT

**NOTICE OF INTENT TO AWARD FOR CONSTRUCTION**

DATE POSTED: [date]

PROJECT TITLE: Petaluma Regional Library Renovation Project

LIBRARY PROJECT NUMBER: **10-19**

The Library Director of the Sonoma County Library intends to recommend to the Commission of the Sonoma County awarding construction of the above-referenced Project to [Name of Contractor]. Any bid protest must be submitted in accordance with Document 002113 (Instructions to Bidders).

Director, Sonoma County Library

By: \_\_\_\_\_

Date: \_\_\_\_\_

END OF DOCUMENT

DOCUMENT 005100

**NOTICE OF AWARD**

Dated: [date]

TO: [Name of Contractor]  
ADDRESS: [Contractor's Address]  
CONTRACT NO.: [#]  
CONTRACT FOR: Petaluma Regional Library Renovation

The Contract Sum of your contract is [dollar amount in words] Dollars (\$[#]).  
Work awarded includes: Base bid + alternate numbers as identified in Document 004113 (Bid Form) and described in Section 011000 (Summary) of the Contract Documents.

- 1.1 Copies of the proposed Contract Documents listed below accompany this Notice of Award.
- 1.2 You must comply with the following conditions by 5:00 p.m. of the 14<sup>th</sup> Day following the date of this Notice of Award, that is, by [date].
  - A. Deliver to Library four (4) fully executed originals of Document 005213 (Agreement Form - Stipulated Sum). Each copy of Document 005213 (Agreement Form - Stipulated Sum) must bear your original signature on the signature page and your initials on each page.
  - B. Deliver to Library one (1) original of Document 006113.13 (Performance Bond Form), executed by you and your surety.
  - C. Deliver to Library one (1) original of Document 006113.16 (Payment Bond Form), executed by you and your surety.
  - D. Deliver to Library one (1) original set of the insurance certificates with endorsements required under Document 007200 (General Conditions).
  - E. Deliver to Library one (1) original copy of Document 006536 (Warranty Form), executed by you.
- 1.3 Failure to comply with these conditions within the time specified will entitle Library to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.
- 1.4 After you comply with the conditions in paragraph 1.2 of this Document 005100, Library will return to you one (1) fully signed original of Document 005213 (Agreement Form - Stipulated Sum) and forward an electronic copy of the Project Manual (including Specifications and Drawings).
- 1.5 Before you may start any Work at the Site, you must attend a preconstruction conference. The preconstruction conference will be arranged through Library's representative. Questions regarding bonds and insurance may be directed to [name and telephone number]. All other inquiries regarding the Project should be directed to [name and email address].

SONOMA COUNTY LIBRARY

BY: \_\_\_\_\_

Library Director

END OF DOCUMENT

**AGREEMENT FORM**

THIS AGREEMENT, dated [date], is by and between [Name of Contractor], whose place of business is located at [Address] ("Contractor"), and the SONOMA COUNTY LIBRARY, a California Joint Powers Authority entity ("Library"), pursuant to the terms and conditions set forth below.

WHEREAS, the Library, by its Commission Resolution No. [#], adopted on [date], awarded to Contractor the following Contract.

**CONTRACT NUMBER #[#]  
PETALUMA REGIONAL LIBRARY RENOVATION PROJECT**

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, Contractor and County agree as follows:

**Article 1. Work**

- 1.1 Contractor shall complete all Work specified in the Contract Documents, in accordance with the Specifications, Drawings, and all other terms and conditions of the Contract Documents.

**Article 2. Notices to County**

- 2.1 Library has designated Trung Doan, Project Manager, to act as Library's Representative(s), who will represent Library in performing County's duties and responsibilities and exercising Library's rights and authorities in Contract Documents. Library may change the individual(s) acting as Library's Representative(s), or delegate one or more specific functions to one or more specific Library's Representatives, including without limitation engineering, architectural, inspection and general administrative functions, at any time with written notice and without liability to Contractor. Each Library Representative is the beneficiary of all Contractor obligations to Library, including without limitation, all releases and indemnities.

- 2.2 All notices or demands to Library under the Contract Documents shall be to Library's Representative at:

**6135 State Farm Drive, Rohnert Park, CA 94928**

or to such other person(s) and address(es) as Library shall provide to Contractor.

**Article 3. Contract Time and Liquidated Damages**

- 3.1 Contract Time.  
Contract Time commences on the date established in Document 005500 (Notice to Proceed). Library reserves the right to modify or alter the Commencement Date of the Work. Library may give a Notice to Proceed at any time within 60 Days after the Notice of Award. Contractor shall not do any Work at the Site prior to the date on which the Contract Time commences to run.

Contractor shall achieve Substantial Completion of the entire Work within [#] Days from the date when the Contract Time commences to run as provided in Document 007200 (General Conditions). Contractor shall complete the Work so that a Final Inspection Report can be issued in accordance with Section 017700 (Closeout Procedures) [#] Days from the date when the Contract Time commences to run as provided in Document 007200 (General Conditions).

- 3.2 Liquidated Damages.  
Library and Contractor recognize that time is of the essence of this Agreement and that



Library will suffer financial loss (see Paragraph 3.3 below), if all or any part of the Work is not completed within the times specified above, plus any extensions thereof allowed in accordance with the Contract Documents. Consistent with Article 14 of Document 007200 (General Conditions), Contractor and Library agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of actual damages incurred by Library because of a delay in completion of all or any part of the Work. Accordingly, Library and Contractor agree that as liquidated damages for delay Contractor shall pay Library:

- 3.2.1 \$[#] for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.
- 3.2.2 \$[#] for each Day that expires after the time specified herein for Contractor to achieve Final Inspection Report of the entire Work, until achieved.

These measures of liquidated damages shall apply cumulatively and except as provided below, shall be presumed to be the damages suffered by Library resulting from delay in completion of the Work.

- 3.3 Liquidated damages for delay shall only cover project administrative (such as Project management and consultant expenses) and cost damages suffered by Library as a result of delay. Liquidated damages shall not cover the cost of completion of the Work, damages resulting from Defective Work, lost revenues or costs of substitute facilities, or damages suffered by others who then seek to recover their damages from Library (for example, delay claims of other contractors, subcontractors, tenants, or other third-parties), and defense costs thereof.

**Article 4. Contract Sum**

- 4.1 Library shall pay Contractor the Contract Sum for completion of Work in accordance with Contract Documents as follows:

---

**TOTAL CONTRACT SUM**

--

**Article 5. Contractor's Representations**

In order to induce Library to enter into this Agreement, Contractor makes the following representations and warranties:

- 5.1 Contractor has visited the Site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.
- 5.2 Contractor has examined thoroughly and understood all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, products specifications or reports, available for Bidding purposes, of physical conditions, including Underground Facilities, which are identified in Document 003119 (Existing Condition Information), or which may appear in the Drawings. Contractor accepts the determination set forth in these Documents and Document 007200 (General Conditions) of the limited extent of the information contained in such materials upon which Contractor may be entitled to rely. Contractor agrees that, except for the information so identified, Contractor does not and shall not rely on any other

information contained in such reports and drawings.

- 5.3 Contractor has conducted or obtained and has understood all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Section 5.2 of this Document 005213) that pertain to the subsurface conditions, as-built conditions, Underground Facilities and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance or furnishing of Work, as Contractor considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Document 007200 (General Conditions); and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Contractor for such purposes.
- 5.4 Contractor has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 5.5 Contractor has given Library prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and as-built drawings and actual conditions and the written resolution thereof through Addenda issued by Library is acceptable to Contractor.
- 5.6 Contractor is duly organized, existing and in good standing under applicable state law, and is duly qualified to conduct business in the State of California.
- 5.7 Contractor has duly authorized the execution, delivery and performance of this Agreement, the other Contract Documents and the Work to be performed herein. The Contract Documents do not violate or create a default under any instrument, agreement, order or decree binding on Contractor.
- 5.8 Contractor has listed the following Subcontractors pursuant to the Subcontractor Listing Law, California Public Contract Code §4100 *et seq.*:

Name of Subcontractor and Location of Mill or Shop	Description of Work: Reference To Bid Items	Subcontractor's License No.


5.9 Contractor has designated [NAME], Project Manager, to act as Contractor's Representative(s), who will represent Contractor in performing Contractor's duties and responsibilities and exercising Contractor's rights and authorities in Contract Documents. Contractor has also designated [NAME], Superintendent, to act as Contractor's Superintendent. Contractor may change the individual(s) acting as Contractor's Representative(s), or delegate one or more specific functions to one or more specific Contractor's Representatives, at any time upon prior written notice and approval and without liability to Library, but Contractor is limited to two representatives.

**Article 6. Contract Documents**

6.1 Contract Documents consist of the following documents, including all changes, Addenda, and Modifications thereto:

- Document 005100 Notice of Award
- Document 005213 Agreement Form
- Document 005500 Notice to Proceed
- Document 006113.13 Performance Bond Form
- Document 006113.16 Payment Bond Form
- Document 006400 Affidavit of Release of Liens Form
- Document 006536 Warranty Form
- Document 006700 Escrow Bid Documents (Optional)
- Document 006800 Escrow Agreement for Security Deposits in Lieu of Retention
- Document 007200 General Conditions
- Document 007300 Supplementary Conditions
- Document 007316 Insurance Requirements
- Document 007373 Statutory Requirements - Apprenticeship Program
- Document 009100 Addenda
- Specifications Divisions as listed in the Table of Contents
- Drawings listed in Drawing No. [#]

6.2 There are no Contract Documents other than those listed in this Document 005213, Article 6. Document 003119 (Existing Condition Information), Document 003126 (Existing Hazardous Materials Information), and the information supplied through these documents, are not Contract Documents. The Contract Documents may only be amended, modified or supplemented as provided in Document 007200 (General Conditions).

**Article 7. Miscellaneous**

7.1 Terms and abbreviations used in this Agreement are defined in Document 007200 (General Conditions) and Section 014200 (References) and will have the meaning indicated therein.

7.2 It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of Library or acting as an employee, agent, or representative of Library, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of the Library is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable

law.

- 7.3 Contractor shall not assign any portion of the Contract Documents, and may subcontract portions of the Contract Documents only in compliance with the Subcontractor Listing Law, California Public Contract Code §4100 *et seq.*
- 7.4 The Contract Sum includes all allowances (if any).
- 7.5 In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, 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. §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 Library tenders final payment to Contractor, without further acknowledgment by the parties.
- 7.6 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at the Library's Headquarters, and shall be made available to any interested party on request.
- 7.7 Pursuant to Section 1861 of the Labor Code, Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.
- 7.8 Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).
- 7.9 This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Sonoma, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in Sonoma County. Both parties hereby waive their rights under California Code of Civil Procedure Section 394 to file a motion to transfer any action or proceeding arising out of the Contract Documents to another venue.
- 7.10 Contractor accepts the claims procedure established by Article 12 of Document 007200 (General Conditions), as established under Section 930.2 of the California Government Code.

IN WITNESS WHEREOF the parties have executed this Agreement in duplicate the day and year first above written.

**SONOMA COUNTY LIBRARY:**

**CONTRACTOR:**

\_\_\_\_\_  
Ann Hammond  
Library Director

\_\_\_\_\_  
[Contractor's name and title of signatory]

Reviewed as to form for Library:

Federal ID #: \_\_\_\_\_

\_\_\_\_\_  
General Counsel

By: \_\_\_\_\_  
[Signature]

Date: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_  
[Please print name here]

Title: \_\_\_\_\_  
[If Corporation: Chairman, President, or Vice President]

By: \_\_\_\_\_  
[Signature]

Date: \_\_\_\_\_

\_\_\_\_\_  
[Please print name here]

Title: \_\_\_\_\_  
[If Corporation: Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer]

END OF DOCUMENT

DOCUMENT 005500

**NOTICE TO PROCEED**

Dated: [date]

To: [Name of Contractor]

Address: [Contractor's Address]

**CONTRACT FOR:                    CONTRACT NUMBER [#]**  
**PETALUMA REGIONAL LIBRARY RENOVATION**

You are notified that the Contract Time under the above Contract will commence to run on [date] (Commencement Date). On that date, you are to start performing your obligations with respect to Work at the Site under the Contract Documents. In accordance with Article 3 of Document 005213 (Agreement Form), the date of Substantial Completion is [date], and the date of Final Completion is [date].

**Before you may start any Work at the Site, you must:**

1. Submit certified Safety Program and related information, Section 015400 (Site Security and Safety).
2. Submit copies of applicable permits, Section 011000 (Summary).
3. Submit approved fire protection plan, if applicable, Section 015400 (Site Security and Safety).
4. Submit copy of Storm Water Pollution Prevention Plan (SWPPP), if applicable, Section 011000 (Summary).

SONOMA COUNTY LIBRARY  
A Joint Powers Authority Entity

By: \_\_\_\_\_

Its: Project Manager

END OF DOCUMENT

**PERFORMANCE BOND FORM**

THIS CONSTRUCTION PERFORMANCE BOND ("Bond") is dated [date], is in the penal sum of [\$ amount] [which is one hundred percent of the Contract Sum], and is entered into by and between the parties listed below to ensure the faithful performance of the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, paragraphs 1 through 12, attached to this page. Any singular reference to [name of Contractor] ("Contractor"), [name of Surety] ("Surety"), the Sonoma County Library ("Library"), or other party shall be considered plural where applicable.

CONTRACTOR:

SURETY:

\_\_\_\_\_

\_\_\_\_\_

Name

Name

Address:

Principal Place of Business:

CONSTRUCTION CONTRACT:

PETALUMA REGIONAL LIBRARY RENOVATION

CONTRACT NUMBER [#]

at 100 Fairgrounds Drive, Petaluma, California;

DATED \_\_\_\_\_, 20\_\_\_\_, in the Amount of \$\_\_\_\_\_ (the "Penal Sum")

CONTRACTOR AS PRINCIPAL

SURETY

Company: (Corp. Seal)

Company: (Corp. Seal)

Petaluma Regional Library Renovation

**Performance Bond Form**



Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Name and Title: \_\_\_\_\_

#### BOND TERMS AND CONDITIONS

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Library for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.
2. If Contractor completely and properly performs all of its obligations under the Construction Contract, Surety and Contractor shall have no obligation under this Bond.
3. If there is no Library Default, Surety's obligation under this Bond shall arise after:
  - 3.1 Library has declared a Contractor Default under the Construction Contract pursuant to the terms of the Construction Contract; and
  - 3.2 Library has agreed to pay the Balance of the Contract Sum:
    - 3.2.1 To Surety in accordance with the terms of this Bond and the Construction Contract; or
    - 3.2.2 To a contractor selected to perform the Construction Contract in accordance with the terms of this Bond and the Construction Contract.
4. When Library has satisfied the conditions of paragraph 3, Surety shall promptly (within 30 Days) and at Surety's expense elect to take one of the following actions:

- 4.1 Arrange for Contractor, with consent of Library, to perform and complete the Construction Contract (but Library may withhold consent, in which case the Surety must elect an option described in paragraphs 4.2, 4.3 or 4.4, below); or
  - 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; provided, that Surety may not select Contractor as its agent or independent contractor without Library's consent; or
  - 4.3 Undertake to perform and complete the Construction Contract by obtaining bids from qualified contractors acceptable to Library for a contract for performance and completion of the Construction Contract and, upon determination by Library of the lowest responsive and responsible Bidder, arrange for a contract to be prepared for execution by Library and the contractor selected with Library's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract; and, if Surety's obligations defined in paragraph 6, below, exceed the Balance of the Contract Sum, then Surety shall pay to Library the amount of such excess; or
  - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances and, after investigation and consultation with Library, determine in good faith its monetary obligation to Library under paragraph 6, below, for the performance and completion of the Construction Contract and, as soon as practicable after the amount is determined, tender payment therefore to Library with full explanation of the payment's calculation. If Library accepts Surety's tender under this paragraph 4.4, Library may still hold Surety liable for future damages then unknown or unliquidated resulting from Contractor Default. If Library disputes the amount of Surety's tender under this paragraph 4.4, Library may exercise all remedies available to it at law to enforce Surety's liability under paragraph 6, below.
5. If Surety does not proceed as provided in paragraph 4, above, then Surety shall be deemed to be in default on this Bond ten Days after receipt of an additional written notice from Library to Surety demanding that Surety perform its obligations under this Bond. At all times Library shall be entitled to enforce any remedy available to Library at law or under the Construction Contract including, without limitation, and by way of example only, rights to perform work, protect Work, mitigate damages, advance critical Work to mitigate schedule delay, or coordinate Work with other consultants or contractors.

6. Surety's monetary obligation under this Bond is limited by the amount of this Bond identified herein as the Penal Sum. This monetary obligation shall augment the Balance of the Contract Sum. Subject to these limits, Surety's obligations under this Bond are commensurate with the obligations of Contractor under the Construction Contract. Surety's obligations shall include, but are not limited to:
  - 6.1 The responsibilities of Contractor under the Construction Contract for completion of the Construction Contract and correction of Defective Work;
  - 6.2 The responsibilities of Contractor under the Construction Contract to pay liquidated damages, and for damages for which no liquidated damages are specified in the Construction Contract, actual damages caused by non-performance of the Construction Contract including, but not limited to, all valid and proper back charges, offsets, payments, indemnities, or other damages;
  - 6.3 Additional legal, design professional and delay costs resulting from Contractor Default or resulting from the actions or failure to act of the Surety under paragraph 4, above (but excluding attorney's fees incurred to enforce this Bond).
7. No right of action shall accrue on this Bond to any person or entity other than Library or its successors or assigns.
8. Surety hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, purchase orders and other obligations, including changes of time. Surety consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, Modification, deletion, or addition to the Contract Documents, or of the Work required thereunder, shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond, unless such change, alteration, Modification, deletion or addition is a cardinal change.
9. Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction where a proceeding is pending between Library and Contractor regarding the Construction Contract, or in the courts of the County of Sonoma, or in a court of competent jurisdiction in the location in which the Work is located. Communications from Library to Surety under paragraph 3.1 of this Bond shall be deemed to include the necessary agreements under paragraph 3.2 of this Bond unless expressly stated otherwise.

10. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to Library shall be mailed or delivered as provided in Document 005213 (Agreement Form). Actual receipt of notice by Surety, Library or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.
  
11. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein.
  
12. Definitions.
  - 12.1 Balance of the Contract Sum: The total amount payable by Library to Contractor pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved Modifications to the Construction Contract.
  
  - 12.2 Construction Contract: The agreement between Library and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.
  
  - 12.3 Contractor Default: Material failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract including, but not limited to, "default" or any other condition allowing a termination for cause as provided in Document 007200 (General Conditions).
  
  - 12.4 Library Default: Material failure of Library, which has neither been remedied nor waived, to pay Contractor progress payments due under the Construction Contract or to perform other material terms of the Construction Contract, if such failure is the cause of the asserted Contractor Default and is sufficient to justify Contractor termination of the Construction Contract.

END OF DOCUMENT

**PAYMENT BOND FORM**

THIS CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND (“Bond”) is dated [date], is in the penal sum of [# that is 100% of contract sum] and is entered into by and between the parties listed below to ensure the payment of claimants under the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, paragraphs 1 through 13, attached to this page. Any singular reference to [name of Contractor] (“Contractor”), [name of Surety] (“Surety”), the Sonoma County Library, a California Joint Powers Authority Entity (“Library”) or other party shall be considered plural where applicable.

CONTRACTOR:

SURETY:

\_\_\_\_\_

Name

Name

Address

Principal Place of Business

\_\_\_\_\_

City/State/Zip

\_\_\_\_\_

City/State/Zip

CONSTRUCTION CONTRACT:

PETALUMA REGIONAL LIBRARY RENOVATION

CONTRACT NUMBER # [#]

at 100 Fairgrounds Drive, Petaluma, California;

DATED \_\_\_\_\_, 20\_\_\_\_, in the Amount of \$\_\_\_\_\_ (the "Penal Sum")

CONTRACTOR AS PRINCIPAL

SURETY

Company: (Corp. Seal)

Company: (Corp. Seal)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Name and Title: \_\_\_\_\_

**BOND TERMS AND CONDITIONS**

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Library and to Claimants, to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
  
2. With respect to Library, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and
  
  - 2.2 Defends, indemnifies and holds harmless Library from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Construction Contract, provided Library has promptly notified Contractor and Surety (at the address set forth on the signature page of this Bond) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to Contractor and Surety, and provided there is no Library Default.
  
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly through its Subcontractors, for all sums due Claimants. If Contractor or its Subcontractors, however, fail to pay any of the persons named in Section 9100 of the California Civil Code, or amounts due under the Unemployment Insurance Code

with respect to Work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor or Subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such Work and labor, then Surety shall pay for the same, and also, in case suit is brought upon this Bond, a reasonable attorney's fee, to be fixed by the court.

4. Consistent with the California Mechanic's Lien Law, Civil Code § 8000, *et seq.*, Surety shall have no obligation to Claimants under this Bond unless the Claimant has satisfied all applicable notice requirements.
5. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety under this Bond.
6. Amounts due Contractor under the Construction Contract shall be applied first to satisfy claims, if any, under any Construction Performance Bond and second, to satisfy obligations of Contractor and Surety under this Bond.
7. Library shall not be liable for payment of any costs, expenses, or attorney's fees of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
8. Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations. Surety further hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Construction Contract, or to the Work to be performed there under, or materials or equipment to be furnished there under or the Specifications accompanying the same, shall in any way affect its obligations under this Bond, and it does hereby waive any requirement of notice or any such change, extension of time, alteration or addition to the terms of the Construction Contract or to the Work or to the Specifications or any other changes.
9. This Bond shall inure to the benefit of the Claimants. Suit against Surety on this Bond may be brought by any Claimant, or its assigns, at any time after the Claimant has furnished the last of the labor or materials, or both, but, per Civil Code § 9558, must be commenced before the expiration of six months after the period in which stop notices may be filed as provided in Civil Code § 9356.

10. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to Library shall be mailed or delivered as provided in Document 005213 (Agreement Form). Actual receipt of notice by Surety, Library or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.
11. This Bond has been furnished to comply with the California Mechanic's Lien Law including, but not limited to, Civil Code §§ 9550 *et seq.* Any provision in this Bond conflicting with said statutory requirements shall be deemed deleted, and provisions conforming to such statutory or other legal requirements shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
12. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
13. Definitions.
  - 13.1.1 Claimant: An individual or entity having a direct contract with Contractor or with a Subcontractor of Contractor to furnish labor, materials or equipment for use in the performance of the Contract, as further defined in California Civil Code § 9100. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a stop notice might be asserted. The term Claimant shall also include the Employment Development Department as referred to in Civil Code § 9554 (b).
  - 13.1.2 Construction Contract: The agreement between Library and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.
  - 13.1.3 Library Default: Material failure of Library, which has neither been remedied nor waived, to pay Contractor as required by the Construction Contract, provided that



failure is the cause of the failure of Contractor to pay the Claimants and is sufficient to justify termination of the Construction Contract.

END OF DOCUMENT

**AFFIDAVIT OF RELEASE OF LIENS FORM**

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS (“Agreement and Release”), made and entered into on [date], by and between the Sonoma County Library, a California Joint Powers Authority Entity (“Library”), and [name of Contractor] (“Contractor”), whose place of business is at [address of Contractor].

RECITALS

- A. Library and Contractor entered into Contract Number [ # ] (the “Contract”).
  
- B. The Work under the Contract has been completed.

Now, therefore, it is mutually agreed between Library and Contractor as follows:

AGREEMENT

- 1. Contractor will not be assessed liquidated damages except as detailed below:

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

2. Subject to the provisions of this Agreement and Release, Library will forthwith pay to Contractor the sum of [# in words] Dollars and [# in words] Cents (\$[#]) under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with Library as of the date of such payment.
  
3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against Library arising from the Contract, except for the claims described in paragraph 4 of this Document 006400. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against Library, and all of its agents, employees, consultants, inspectors, representatives, assignees and transferees, except for the Disputed Claims set forth in paragraph 4 of this Document 006400. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in paragraph 6 of this Document 006400.
  
4. The following claims submitted under Document 007200 (General Conditions), Article 12, are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

Claim No.	Date Submitted	Description of Claim	Amount of Claim
-----------	----------------	----------------------	-----------------

[Insert information, including attachment if necessary]

5. Consistent with California Public Contract Code Section 7100, Contractor hereby agrees that, in consideration of the payment set forth in paragraph 2 of this Document 006400, Contractor hereby releases and forever discharges Library, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract
  
6. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.

7. Contractor shall immediately defend, indemnify and hold harmless Library, any of Library's Representatives, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in paragraph 4 of this Document 006400.

8. Contractor hereby waives the provisions of California Civil Code Section 1542, which provide as follows:

A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM, MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR

9. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal or other law, ruling, or regulation, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.

11. All rights of Library shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

\*\*\* CAUTION: THIS IS A RELEASE – PLEASE READ BEFORE EXECUTING \*\*\*

SONOMA COUNTY LIBRARY,  
A Joint Powers Authority Entity

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Ann Hammond  
Library Director

**[CONTRACTOR'S Name]**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

REVIEWED AS TO FORM:

---

Library General Counsel

---

, 20\_\_

END OF DOCUMENT

**WARRANTY FORM**

TO THE SONOMA COUNTY LIBRARY, for construction of

PETALUMA REGIONAL LIBRARY RENOVATION

at 100 Fairgrounds Drive, Petaluma, California.

The undersigned Contractor hereby guarantees all construction performed on this Project and also guarantees all material and equipment incorporated therein.

Contractor hereby grants to the Sonoma County Library ("Library") for a period of [# of years in words] ([#]) years following the date of Substantial Completion of the Work, or such longer period specified in the Contract Documents ("Guaranty Period"), its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use or occupancy of the Work performed by Contractor shall constitute an acceptance of Work not done in accordance with the Contract Documents or relieve Contractor of liability in respect to any express guarantees, warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting there from which shall appear within the Guaranty Period.

If at any time during the Guaranty Period any Work is found to be Defective, Contractor shall promptly (preferably within 48 hours of notification by Library, but no later than 5 days following notification by Library), without cost to Library and in accordance with Library's written instructions, correct such Defective Work. Contractor shall remove any Defective Work identified by Library and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Library may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects

are discovered outside the correction period, Library shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be Defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the Guaranty Period.

This Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of Contractor.



All abbreviations and undefined terms used in this Guaranty shall have the meanings set forth in the Contract Documents, including, without limitation, Document 007200 (General Conditions) and Section 014200 (References and Definitions).

---

[Contractor's name]

By: \_\_\_\_\_

[Signature]

---

[Please print name here]

Title: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

END OF DOCUMENT

**ESCROW BID DOCUMENTS**

**1.1 REQUIREMENTS FOR ESCROW BID DOCUMENTS.**

- A. Within the time period established in Document 002113 (Instructions to Bidders), Contractor shall submit to Library a set of Escrow Bid Documents as defined in paragraph 2 below. Escrow Bid Documents will be used only in the manner and for the purposes described in this Document 006700.
- B. The submission of the Escrow Bid Documents, as with the bonds and insurance documents required under Document 002113 (Instructions to Bidders), is considered an essential part of the Contract award. Should Contractor fail to make the submission within the allowed time specified, Contractor may be deemed to have failed to enter into the Contract, Contractor shall forfeit the amount of its Bid security accompanying Contractor's Bid, and Library may award the Contract to the next lowest responsive responsible Bidder.
- C. NO PAYMENTS WILL BE MADE, NOR WILL LIBRARY ACCEPT CHANGE ORDER REQUESTS UNTIL THE ABOVE-REQUIRED INFORMATION IS SUBMITTED AND APPROVED. ALTERNATIVELY, LIBRARY MAY DECLARE THE BID NON-RESPONSIVE.
- D. Contractor shall submit the Escrow Bid Documents, in person by an authorized representative of Contractor, to:

**Dave Tichava**

**6135 State Farm Drive, Rohnert Park, CA 94928**

**1.2 SCOPE OF ESCROW BID DOCUMENTS.**

- A. Within the time period specified in Document 002113 (Instructions to Bidders), Contractor shall submit one copy of all documentary information received or generated by Contractor in preparation of Bid prices for the Contract Documents, as specified in paragraphs 5 and 6 of this Document 006700. This material is referred to in this Document 006700 as the "Escrow Bid Documents." Contractor's Escrow Bid Documents will be held in escrow as provided in this Document 006700.

- B. Contractor represents and agrees, as a condition of award of the Contract, that the Escrow Bid Documents constitute all written information used in the preparation of its Bid, and that no other written Bid preparation information shall be considered in resolving disputes or claims or may be considered in legal proceedings. Contractor also agrees that nothing in the Escrow Bid Documents shall change or modify the terms or conditions of the Contract Documents. Contractor is advised that the Escrow Bid Documents will only be used as a guide in the resolution of disputes and claims.

**1.3 OWNERSHIP OF ESCROW BID DOCUMENTS.**

- A. The Escrow Bid Documents are, and shall always remain, the property of Contractor, subject to joint review by Library and Contractor, as provided in this Document 006700.
- B. Library stipulates and expressly acknowledges that the Escrow Bid Documents constitute trade secrets. This acknowledgement is based on Library's express understanding that the information contained in the Escrow Bid Documents is not known outside Contractor's business, is known only to a limited extent and only by a limited number of Contractor's Employees, is safeguarded while in Contractor's possession, is extremely valuable to Contractor and could be extremely valuable to Contractor's competitors by virtue of it reflecting Contractor's contemplated construction techniques. Library further acknowledges that the Escrow Bid Documents and the information contained in them are made available to Library only because such action is an express pre-requisite to award of the Contract. Library agrees to safeguard the Escrow Bid Documents, and all information contained in them, against disclosure to the fullest extent permitted by law, consistent with paragraph 4 of this Document 006700.

- 1.4** Escrow bid documents may be used in the determination of price adjustments and change orders and in the settlement of disputes and claims. If used in legal proceedings, escrow bid documents shall be subject to an appropriate protective order limiting their disclosure.

**1.5 FORMAT AND CONTENTS OF ESCROW BID DOCUMENTS.**

- A. Contractor may submit Escrow Bid Documents in their usual cost-estimating format; a standard format is not required. Contractor shall prepare and submit the Escrow Bid Documents in English.

- B. Library requires Contractor to itemize clearly in the Escrow Bid Documents the estimated costs of performing the Work of each Bid item contained in Contractor's Bid. Contractor shall separate Bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documents shall include all Subcontractor bids or quotes, supplier bids or quotes, quantity take-offs, crews, equipment, calculations of rates of production and progress, copies of quotes from Subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by Contractor to arrive at the prices contained in the Bid. Escrow Bid Documents shall include costs of scheduled maintenance, depreciation, fleet rental expense discounts and incentives, and similar cost adjustments if used by Contractor to calculate its Bid prices. Estimated costs shall be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in Contractor's usual format. Contractor shall identify its allocation of indirect costs, contingencies, markup and other items to each Bid item.
- C. Contractor shall identify all costs. For Bid items amounting to less than \$10,000, Contractor may estimate costs without a detailed cost estimate, provided that Contractor includes applicable labor, equipment, materials and subcontracts, and allocates applicable indirect costs, contingencies and markup.
- D. Bid documents provided by Library should not be included in the Escrow Bid Documents unless needed to comply with these requirements.

**1.6 SUBMITTAL OF ESCROW BID DOCUMENTS.**

- A. Submit Escrow Bid Documents in a container clearly marked on the outside with Contractor's name, date of submittal, Project name and the words "Escrow Bid Documents - Open only in the presence of Authorized Representatives of both Library and Contractor." Library will review the Escrow Bid Documents for initial compliance. Library has three Days after receipt of Bidder's Escrow Bid Documents to demand additional information.
- B. By submitting Escrow Bid Documents, Contractor represents that the material in the Escrow Bid Documents constitutes all the documentary information used in preparation of the Bid and that Contractor has personally examined the contents of the Escrow Bid Documents container and has found that the documents in the container are complete. Contractor agrees that it will not introduce or rely on any other documents to prove how it prepared its Bid.

- C. If Contractor's Bid is based upon subcontracting any part of the Work, each Subcontractor whose total subcontract price exceeds five percent of the total Contract Sum proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Such documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.
- D. If Contractor wishes to subcontract any portion of the Work after award, Library retains the right to require Contractor to submit Escrow Documents for the Subcontractor before approval of the subcontract.

**1.7 STORAGE, EXAMINATION, AND FINAL DISPOSITION OF ESCROW BID DOCUMENTS.**

- A. The Escrow Bid Documents will be placed in escrow until Final Completion of Work on the Project, in a mutually agreeable institution. Contractor shall pay the cost of storage for the Escrow Bid Documents until that time. The storage facilities shall be the appropriate size for all the Escrow Bid Documents and located conveniently to both Library's and, to the extent reasonably possible, Contractor's offices, but in no event outside the Library of Sonoma.
- B. Both Library and Contractor shall examine the Escrow Bid Documents, at any time deemed necessary by either Library or Contractor, to assist in the negotiation of price adjustments and Change Orders or the settlement of disputes and claims. Examination of the Escrow Bid Documents is subject to the following conditions:
- 1) As trade secrets, the Escrow Bid Documents are proprietary and confidential under paragraph 3.B. of this Document 006700.
  - 2) Library and Contractor (and any Subcontractor, to the extent Escrow Bid Documents are required by a Subcontractor) shall each designate in writing to the other party(s) at least seven (7) days prior to any examination, representatives who are authorized to examine the Escrow Bid Documents. Except as otherwise provided in a court order, no other persons shall have access to the Escrow Documents.
  - 3) Except as otherwise provided in a court order, access to the documents may take place only in the presence of duly designated representatives of both Library and Contractor. If Contractor fails to designate a representative or appear for joint examination on seven Days' notice, then Library's Representative may examine the Escrow Bid Documents upon an additional three Days' notice.
  - 4) Following Final Completion of Work on the Project and achievement of final settlement, Library shall direct the escrow agent holding the Escrow Bid Documents in writing to return those documents to Contractor.

END OF DOCUMENT

**ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION**

P.C.C. §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this \_\_\_\_ [date] day of \_\_\_\_\_ [month], \_\_\_\_ [year], by and between the following: the SONOMA LIBRARY LIBRARY, a California Joint Powers Authority entity (hereinafter called the "Library"), whose address is 6135 State Farm Drive, Rohnert Park, CA 94928; [name of Contractor] ("Contractor"), whose place of business is located at [Contractor's Address]; and [name of Bank] ("Escrow Agent"), a state or federally chartered bank in the State of California, whose place of business is located at [Bank's Address].

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

1. Pursuant to Section 22300 of Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Library pursuant to Contract Number [ # ] entered into between Library and Contractor for the Petaluma Regional Library Renovation in the amount of [Contract Sum] dated [Date of Contract] (the "Contract"). Alternatively, on written request of Contractor, Library shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify Library within ten (10) days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between Library and Contractor. Securities shall be held in name of \_\_\_\_\_, and shall designate Contractor as the beneficial owner.
2. Library shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in paragraph 1 of this Document 006800.
3. When Library makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment

of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when Library pays Escrow Agent directly.

4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of Library. Such expenses and payment terms shall be determined by Library, Contractor, and Escrow Agent.
5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to Library.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Library to Escrow Agent that Library consents to withdrawal of amount sought to be withdrawn by Contractor.
7. Library shall have the right to draw upon the securities in event of default by Contractor. Upon seven Days written notice to Escrow Agent from Library of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by Library.
8. Upon receipt of written notification from Library certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.
9. Escrow Agent shall rely on written notifications from Library and Contractor pursuant to paragraphs 5 through 8, inclusive, of this Document 006800, and Library and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.



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

On behalf of Library:

On behalf of Contractor:

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

Address

\_\_\_\_\_

\_\_\_\_\_  
City/State/Zip

\_\_\_\_\_  
City/State/Zip

On behalf of Escrow Agent:

\_\_\_\_\_  
Title

\_\_\_\_\_

Name

---

Signature

---

Address

---

City/State/Zip

At the time the Escrow Account is opened, Library and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 006800.

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

Library

Contractor

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---

---

Title

Title

---

---

Name

Name

Petaluma Regional Library Renovation

**Escrow Agreement for Security Deposits in Lieu of Retention**

---

Signature

---

Signature

Escrow Agent

---

---

Title

---

Name

---

Signature

REVIEWED AS TO FORM:

---

Library General Counsel

---

Date

END OF DOCUMENT

**GENERAL CONDITIONS**

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## **GENERAL CONDITIONS**

### **1 INTERPRETATION OF CONTRACT**

#### **1.1 Defined Terms**

1.1.A. All abbreviations and definitions of terms used and not otherwise defined in this Document 007200 are set forth in Section 014200 (References). This Document 007200 subdivides at first level into Articles, and then into paragraphs.

#### **1.2 Contract Documents**

1.2.A. Contract Documents are complementary; what is called for by one is as binding as if called for by all. Contract Documents shall not be construed to create a contractual relationship of any kind between (i) Architect, Engineer or any Library's Representative and Contractor; (ii) Library and/or its representatives and a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (iii) between any persons or entities other than Library and Contractor.

#### **1.3 Precedence Of Documents**

1.3.A. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:

- 1.3.A.1. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
- 1.3.A.2. Document 005213 (Agreement Form - Stipulated Sum), and terms and conditions referenced therein;
- 1.3.A.3. Supplementary Conditions;
- 1.3.A.4. General Conditions;
- 1.3.A.5. Division 1 Specifications;
- 1.3.A.6. Drawings and Division 1 through 49 Specifications;
- 1.3.A.7. Written numbers over figures, unless obviously incorrect (i.e. [six] over [6]);
- 1.3.A.8. Figured dimensions over scaled dimensions;
- 1.3.A.9. Large-scale Drawings over small-scale Drawings.

1.3.B. Any conflict between Drawings and Division 1 through 49 Specifications will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

1.3.C. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

### **2 BID PERIOD INVESTIGATIONS AND SUBCONTRACTING**

#### **2.1 Investigation Prior To Bidding**

2.1.A. Prior to bidding, Contractor must investigate fully the Work of the Contract. Contractor must visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions, and all other information made available for bidding. Contractor's investigation shall include, but is not limited to, a thorough examination of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, available for Bidding purposes, of physical conditions, including Underground Facilities and information identified in Document 003119 (Existing Condition Information) and/or Document 003126 (Existing Hazardous Materials Information) (if used), or which may appear in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor shall completely and thoroughly correlate all such information and consider such information fully, prior to and as a condition of submitting its Bid. Contractor shall make inquiry as required in Document 003119



(Existing Condition Information).

- 2.1.B. Prior to submitting its Bid, Contractor shall take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site).
- 2.1.C. Prior to submitting its Bid, Contractor must correlate its experience, knowledge and the results of its required investigation with the terms and conditions of the Contract Documents, and must give Library prompt written notice of all conflicts, errors, ambiguities, or discrepancies of any type, that it may discover in or among the Contract Documents, as-built drawings (if any) and/or actual conditions. Contractor shall give this notice during the Bid period and submission of a Bid indicates Contractor's agreement that Library responded to the notice through Addenda issued by Library which is acceptable to Contractor.
- 2.1.D. Prior to submitting its Bid, Contractor must consider fully the fact that information supplied regarding existing Underground Facilities at or contiguous to the Site is in many cases based on information furnished to Library by others (e.g., the builders of such Underground Facilities or others), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor must also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.
- 2.1.E. Prior to submitting its Bid, Contractor shall conduct (or request that Library have conducted) any such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto or which Contractor deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.
- 2.1.F. Prior to submitting its Bid, Contractor may rely on Library-supplied information regarding existing conditions only where such conditions are underground and not subject to reasonable verification. If existing information supplied by Library indicates a discrepancy or a substantial risk of inaccuracy or omission, then Contractor must request specific additional information. Contractor shall advise Library in writing during the Bid period of any questions, suppositions, inferences or deductions Contractor may have, for Library's review and response by Addenda, and may not assert any such matters later that were not brought forth during the Bid period.
- 2.1.G. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing this required pre-Bid investigation, and shall not be entitled to change orders (time or compensation) due to information or conditions that Contractor should have known as a part of this pre-Bid investigation.

## **2.2 Supplied Information on Underground Existing Conditions**

- 2.2.A. Regarding Underground Facilities shown in the Contract Documents or supplied through Document 003119 (Existing Condition Information), Library has compiled this information in good faith, relying on its records and third party records. Because of the nature and location of Library and the Project, the existence of Underground

Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. In Article 14 of this Document 007200, this Contract establishes a heightened standard for claims involving Underground Facilities. Contractor shall consider this fact in its bidding and in its planning and execution of the Work involving Underground Facilities.

2.2.B. Regarding subsurface conditions other than Underground Facilities, shown on the Contract Documents or supplied in Document 003119 (Existing Conditions Information), Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. Library is not responsible for the completeness of any subsurface condition information for bidding or construction, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, Library is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

### **2.3 Supplied Information on Above-Ground Existing Conditions**

2.3.A. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied through Document 003119 (Existing Condition Information), such information has been compiled in good faith, however, Contractor must independently verify such information. Library does not expressly or impliedly warrant or represent that information as to aboveground conditions or as-built conditions indicated in the Contract Documents or Document 003119, is correctly shown or indicated, or otherwise complete for construction purposes.

2.3.B. As a condition to bidding, Contractor shall verify by independent investigation all such aboveground and as-built conditions, and bring any discrepancies to Library's attention through written question. In submitting its Bid, Contractor shall rely on the results of its own independent investigation and shall not rely on Library-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.

### **2.4 Subcontractors**

2.4.A. Consistent with Public Contract Code Sections 4101 *et seq.*, Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without Library's written approval. At Library's request, Contractor shall provide Library with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

2.4.B. Subcontract agreements shall preserve and protect the rights of Library under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written agreement (1) to be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward Library under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

2.4.C. Contractor shall provide for the assignment to Library of all rights any Subcontractor may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents.

2.4.D. Library shall be deemed to be an intended third-party beneficiary of all Subcontracts (of any tier) for the provision of labor, services, supplies or material to the Project, and each such agreement shall so provide.

### **3 CONTRACT AWARD AND COMMENCEMENT OF THE WORK**

#### **3.1 Time Allowances for Performance of Contract Documents**

- 3.1.A. Library will make the Award of Contract by issuing a Notice of Award. As a condition to Library signing Document 005213 (Agreement Form – Stipulated Sum), however, Contractor shall deliver to Library the executed agreements, forms, bonds and insurance documents required by Document 002113 (Instructions to Bidders) in the required quantities and within the required times.
- 3.1.B. The Contract Time will commence to run on the date indicated in the Notice to Proceed (Commencement Date).
- 3.1.C. The total number of Days for completion of the Work under the Contract Documents shall be as provided in Document 005213 (Agreement Form - Stipulated Sum).

#### **3.2 Commencement Of Work**

- 3.2.A. Contractor shall commence work on the Site on the Commencement Date found in the Notice to Proceed (Document 005500). Contractor shall not do any Work at the Site prior to that date.

### **4 INSURANCE AND INDEMNIFICATION**

#### **4.1 Insurance**

- 4.1.A. See Document 007316 (Insurance Requirements), incorporated herein by this reference, for applicable insurance requirements.

#### **4.2 Indemnification**

- 4.2.A. Library and each of its officers, employees, consultants and agents including, but not limited to the Commission, Architect, Engineer and each Library's Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person; or damage to property resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence, attributable to performance or character of the Work, and Contractor releases all of the foregoing persons and entities from any and all such claims.
- 4.2.B. To the furthest extent permitted by law (including without limitation California Civil Code Section 2782), Contractor shall assume defense of, and indemnify and hold harmless, Library and each of its officers, employees, consultants and agents, including but not limited to the Commission, Architect, Engineer and each Library's Representative, from claims, suits, actions, losses and liability of every kind, nature and description, including but not limited to claims and fines of regulatory agencies and attorney's fees and consultant's fees, directly or indirectly arising out of, connected with or resulting from performance of the Work, failure to perform the Work, or condition of the Work which is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether it is caused in part by the negligence of Library or by any person or entity required to be indemnified hereunder.
- 4.2.C. With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity against Library and each of its officers, employees, consultants and agents including, but not limited to Library, the Commission, Architect, Engineer and each Library's Representative.
- 4.2.D. Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them.
- 4.2.E. To the furthest extent permitted by law (including, without limitation, Civil Code Section 2782), the indemnities, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of Contract, negligence (active or passive), fault or strict liability of the party(ies) indemnified, released, or limited in liability, and

shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents. If Contractor fails to perform any of these defense or indemnity obligations, Library may in its discretion back charge Contractor for Library's costs and damages resulting therefrom and withhold such sums from progress payments or other Contract moneys which may become due.

- 4.2.F. The indemnities in the Contract Documents shall not apply to any indemnified party to the extent of its sole negligence or willful misconduct; nor shall they apply to Library or other indemnified party to the extent of its active negligence.
- 4.2.G. Contractor's obligations under this paragraph 4.2 shall survive completion of the Work or termination of the Contract Documents for any reason whatsoever.

## **5 DRAWINGS AND SPECIFICATIONS**

### **5.1 Intent**

- 5.1.A. Drawings and Specifications are intended to describe a functionally complete and operable Project (and all parts thereof) to be constructed in accordance with the requirements of Contract Documents. Contractor shall perform any work, provide services and furnish any materials or equipment that may reasonably be inferred from the requirements of Contract Documents or from prevailing custom or trade usage as being required to produce this intended result. Contractor shall interpret words or phrases used to describe Work (including services), materials, or equipment that have well-known technical or construction industry or trade meaning in accordance with that meaning. Drawings' intent specifically includes the intent to depict construction that complies with all applicable laws, codes and standards.
- 5.1.B. As part of the "Work," Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, Shop Drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.
- 5.1.C. Contractor shall perform reasonably implied parts of Work as "incidental work" although absent from Drawings and Specifications. Incidental work includes any work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental work includes any work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents including required tasks to be performed under Division 1 of Specifications. Contractor shall perform incidental work without extra cost to Library. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of incidental work shall be included in price Bid and Contract Sum.

### **5.2 Drawing Details**

- 5.2.A. A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by Library. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.

### **5.3 Interpretation Of Drawings And Specifications**

- 5.3.A. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in Drawings and Specifications, or should Contractor have any

questions or requests relating to Drawings or Specifications, Contractor shall refer the matter to Library, in writing, in accordance with Section 012600 ( Contract Modification Procedures). Library will issue with reasonable promptness written responses, clarifications or interpretations as Library may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give Library prompt written notice as provided in Section 012600 (Contract Modification Procedures). If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with Library's response, clarification, or interpretation and may make a written claim for the adjustment as provided in Article 12 of this Document 007200.

#### **5.4 Checking Of Drawings**

5.4.A. Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent information shown in the Contract Documents and all applicable field conditions and measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Contractor shall promptly report to Library, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from Library before proceeding with any Work affected thereby. Dimensions shown on Drawings shall be followed; Contractor shall not scale Drawings.

#### **5.5 Standards To Apply Where Specifications Are Not Furnished**

5.5.A. The following general specifications shall apply wherever in the Specifications, or in any directions given by Library in accordance with or supplementing Specifications, it is provided that Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed specifications are shown. Materials or manufactured articles shall be of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried in stock, the materials or manufactured articles shall conform to industry standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited in Section 014200 (References), for first-class work of the kind required. Contractor shall specify in writing to Library the materials to be used or Work to be performed under this paragraph 5.5 fourteen (14) Days prior to furnishing such materials or performing such Work.

#### **5.6 Deviation from Specifications and Drawings**

5.6.A. Contractor shall perform Work in accordance with Drawings and Specifications. Contractor shall not deviate from Drawings or the dimensions given in the Drawings or the Specifications without Library's advance written approval of the proposed deviation.

5.6.B. If Library elects to change the Work, all changes in the Contract Documents will be made as set forth in Article 14 of this Document 007200.

#### **5.7 Ownership And Use Of Drawings, Specifications And Contract Documents**

5.7.A. Drawings, Specifications and other Contract Documents were prepared for use for Work of Contract Documents only. No part of Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Library. Any unauthorized use of Contract Documents is prohibited and at the sole liability of the user.

5.7.B. The Library will be issuing the Drawings and Project Manual electronically for the Contractor's use, unless specifically stated otherwise.

### **6 CONSTRUCTION BY LIBRARY OR BY SEPARATE CONTRACTORS**

#### **6.1 Library's Right To Perform Construction And To Award Separate Contracts**

- 6.1.A. Library may perform, with its own forces, construction or operations related to the Project. Library may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility owners perform other work. When separate contracts are awarded for different portions of the Project or other construction or operations on the Site, the term "Contractor" in these Contract Documents shall mean the Contractor herein.

## **6.2 Mutual Responsibility**

- 6.2.A. Contractor shall afford all other contractors, utility owners, and Library (if Library is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' work, and shall cooperate with them to facilitate the progress of the Work.
- 6.2.B. Contractor shall coordinate its Work with the work of other contractors, Library, and utility owners. Contractor shall hold coordination meetings with other contractors, Library and its representatives, and utility owners as required by Section 013150 (Project Meetings).
- 6.2.C. Unless otherwise provided in the Contract Documents, Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of other contractors, Library or utility owners by cutting, excavating or otherwise altering the work of others and will only cut or alter the work of others with the written consent of Library and the others whose work will be affected.
- 6.2.D. Contractor's duties and responsibilities under paragraph 6.2.A of this Document 007200 are for the benefit of Library and also for the benefit of such other contractors and utility owners working at the Site to the extent that there are comparable provisions for the benefit of Contractor in the direct contracts between Library and such other contractors and utility owners.
- 6.2.E. To the extent that any part of Contractor's Work is to interface with work performed or installed by other contractors, Library, or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to Library in writing any defect in in-place work that will impede or increase the cost of Contractor's interface unless corrected. Library will require the entity responsible for the Defective Work to make corrections so as to conform to its contract requirements, or, if the defect is the result of an error or omission in the Contract Documents, issue a Change Order. If Contractor fails to measure, inspect and/or report to Library in writing defects that are reasonably discoverable, Contractor shall bear all costs of accomplishing the interface acceptable to Library. This provision shall be included in any and all other contracts or subcontracts for Work to be performed where such a conflict could exist.

## **6.3 Library Authority Over Coordination**

- 6.3.A. Library will have authority over coordination of the activities of multiple contractors in cases where Library performs work with its own forces or contracts with others for the performance of other work on the Project, or utilities work on the Site. Library may at any time and in its sole discretion, designate a person or entity other than Library to have authority over the coordination of the activities among the various contractors. Library's authority with respect to coordination of the activities of multiple contractors and utility owners shall not relieve Contractor of its obligation to other contractors and utility owners to coordinate its Work with other contractors and utility owners as specified in paragraph 6.2 of this Document 007200. Contractor shall promptly notify Library in writing when another contractor on the Project fails to coordinate its work with the Work of Contract Documents.
- 6.3.B. Contractor shall suspend any part of the Work or carry on the same in such manner as directed by Library when such suspension or prosecution is necessary to facilitate the work of other contractors or workers. No damages or claims by Contractor will be allowed if the suspension or Work change is due in whole or in part to Contractor's

failure to perform its obligation to coordinate its Work with other contractors, Library, and utility owners. Damages or claims will be allowed only to the extent of fault by Library if the suspension or Work change is due in whole or in part to another contractor's failure to coordinate its work with Contractor, other contractors, Library, and utility owners. Library reserves the right to back charge Contractor for any damages or claims incurred by other contractors as a result of Contractor's failure to perform its obligations to coordinate with other contractors, Library, and utility owners. Library may deposit the funds retained with a Court of competent jurisdiction pursuant to applicable interpleader procedures and Contractor releases Library of further liability regarding such funds.

## **7 PAYMENT BY LIBRARY**

### **7.1 Receipt And Processing Of Applications For Payment**

7.1.A. As required by Section 012000 (Price and Payment Procedures), Contractor shall prepare the schedules, submit Applications for Payment, and warrant title to all Work covered by each Application for Payment. Library will review Contractor's Applications for Payment and make payment thereon, and Contractor shall make payments to Subcontractors, suppliers and others, as required by Section 012000 (Price and Payment Procedures).

## **8 CONTROL OF THE WORK**

### **8.1 Subcontractors**

8.1.A. Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor. The Contractor may not assign any portion, or any rights hereunder, of the Contract Documents without the Library's express written consent or, where applicable, compliance with the Subcontractor Listing Law.

### **8.2 Supervision Of Work By Contractor**

8.2.A. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the attention and applying such personal skills and expertise as may be required and necessary to perform Work in accordance with Contract Documents. Contractor shall be solely responsible for and have control and charge of construction means, methods, techniques, sequences and procedures, safety precautions and programs in connection with the Work. Contractor shall be responsible to see that the completed Work complies accurately with Contract Documents.

8.2.B. Contractor shall keep on the Site at all times during Work progress a competent resident Superintendent in conformance with paragraph 10.3.A.

### **8.3 Observation Of Work By Library**

8.3.A. Library Representatives: Library's Representative(s) will have limited authority to act on behalf of Library as set forth in the Contract Documents. Except as otherwise provided in these Contract Documents or subsequently identified in writing by Library, Library will issue all communications to Contractor through Library's Representative, and Contractor shall issue all communications to Library through Library's Representative in a written document delivered to Library. Should any direct communications between Contractor and Library's consultants, architects or engineers not identified in Article 2 of Document 005213 (Agreement Form - Stipulated Sum) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to Library's Representative.

8.3.B. Means and Methods of Construction: Subject to those rights specifically reserved in the Contract Documents, Library will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing

or performance of Work. Library will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

- 8.3.C. In exercising its responsibilities and authorities under the Contract Documents, Library does not assume any duties or responsibilities to any Subcontractor or supplier and does not assume any duty of care to Contractor, Contractor's Subcontractors or suppliers. Except as expressly set forth in the Contract Documents, in exercising their respective responsibilities and authorities under the Contract Documents, neither Architect, Engineer nor any Library Representative assumes any duties or responsibilities to any Subcontractor, sub-Subcontractor or supplier nor assumes any duty of care to Contractor or any Subcontractor, sub-Subcontractor or suppliers.
- 8.3.D. Work shall be performed under Library's general observation and administration. Contractor shall comply with Library's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. Library's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.
- 8.3.E. Library may engage an independent consultant or architect (collectively for purposes of this paragraph 8.3, "Consultant") to assist in administering the Work. If so engaged, Consultant will advise and consult with Library, but will have authority to act on behalf of Library only to extent provided in the Contract Documents or as set forth in writing by Library. Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Consultant will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.
- 8.3.F. Consultant may review Contractor's Submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents.
- 8.3.G. Consultant may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Consultant may recommend to Library that it disapprove or reject Work that Consultant believes to be defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. Library will also have authority to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.
- 8.3.H. Consultant may conduct inspections to recommend to Library the dates that Contractor has achieved Substantial Completion and when the Final Inspection Report can be issued, and will receive and forward to Library for review written warranties and related documents required by the Contract Documents.

#### **8.4 Access To Work**

- 8.4.A. During performance of Work, Library and its agents, consultants, and employees may at any time enter upon Work, shops or studios where any part of the Work may be in preparation, or factories where any materials for use in Work are being or are to be manufactured, and Contractor shall provide proper and safe facilities for this purpose, and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent as Library's interests may require. Other contractors, Library workers or utility owners performing work for Library may also enter upon Work for all purposes required by their respective contracts. Subject to the rights reserved in the Contract Documents, Contractor shall have sole care, custody, and control of the Site and its Work areas.
- 8.4.B. Library may, at any time, and from time to time, during the performance of the Work, enter the Work Site for the purpose of installing any necessary work by Library labor



or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, Library shall endeavor not to interfere with Contractor and Contractor shall not interfere with other work being done by or on behalf of Library.

- 8.4.C. If, prior to completion and final acceptance of all the Work, Library takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating return to Contractor), then, while Library is in possession of the same, Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from Contractor's fault or negligence. Such taking of possession by Library shall not relieve Contractor from any provisions of the Contract respecting such structure, other than to the extent specified in the preceding sentence, nor constitute a final acceptance of such structure or facility. See *also* Section 011000 (Summary).
- 8.4.D. If, following installation of any equipment or facilities furnished by Contractor, defects requiring correction by Contractor are found, Library shall have the right to operate such unsatisfactory equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to Library.

## **9 WARRANTY, GUARANTY, AND INSPECTION OF WORK**

### **9.1 Warranty And Guaranty**

- 9.1.A. General Representations and Warranties: Contractor represents and warrants that it is and will be at all times fully qualified and capable of performing every Phase of the Work and completing Work in accordance with the terms of the Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of the Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, architecture and/or engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of the Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by the Contract Documents.
- 9.1.B. Extended Guarantees: Any guaranty exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply Library with all warranty and guaranty documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.
- 9.1.C. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this paragraph 9.1.C. are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to Library that:
- 9.1.C.1. To Contractor's knowledge after due inquiry, no lead or Asbestos-containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or Asbestos-containing materials were discovered, Contractor made immediate written disclosure to Library.
- 9.1.C.2. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment

containing PCBs are or were located on the Project at any time during Contractor's construction thereof.

9.1.C.3. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to Library.

9.1.C.4. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any Work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide Library with copies thereof.

## **9.2 Inspection Of Work**

9.2.A. All materials, equipment, and workmanship used in Work shall be subject to inspection and testing at all times during construction and/or manufacture in accordance with the terms of Contract Documents. Work and materials, and manufacture and preparation of materials, from beginning of construction until Final Completion and acceptance of Work, shall be subject to inspection and rejection by Library, its agents, representatives or independent contractors retained by Library to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, Library shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.

9.2.B. Contractor shall give Library timely notice of readiness of Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests. Contractor shall also coordinate, schedule and give adequate notice to the appropriate inspection personnel of any Work that can only be inspected as it is placed or assembled (for example, concrete or masonry work), to enable the constant presence of such inspection personnel during such Work.

9.2.C. If applicable laws or regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish Library with the required certificates of inspection, or approval. Library will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Additionally, in the event that a scheduled inspection is canceled in less than 24 hours notice by Contractor and Library incurs costs associated with the cancellation, Contractor will reimburse Library for the actual costs of the canceled inspections. The amount will be deducted from payment owed Contractor.

9.2.D. If Contractor covers any Work, or the work of others, prior to any required inspection,

test or approval without written approval of Library, Contractor shall uncover the Work at Library's request. Contractor shall bear the expense of uncovering Work and replacing Work.

- 9.2.E. In any case where Contractor covers Work contrary to Library's request, Contractor shall uncover Work for Library's observation or inspection at Library's request. Contractor shall bear the cost of uncovering and re-covering the Work.
- 9.2.F. Whenever required by Library, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory, Library, in manner herein prescribed for paying for alterations, Modifications, and extra Work, except as otherwise herein specified, will pay for examination.
- 9.2.G. Inspection of the Work by or on behalf of Library, or Library's failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Contractor shall have an absolute duty, in the absence of a written Change Order signed by Library, to perform Work in conformance with the Contract Documents.
- 9.2.H. Any inspection, evaluation, or test performed by or on behalf of Library relating to the Work is solely for the benefit of Library, and shall not be relied upon by Contractor. Contractor shall not be relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by Library, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

### **9.3 Correction Of Defective Work**

- 9.3.A. If Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, Library may order Contractor to replace any Defective Work, or stop any portion of Work to permit Library (at Contractor's expense) to replace such Defective Work. These Library rights are entirely discretionary on the part of the Library, and shall not give rise to any duty on the part of Library to exercise the rights for the benefit of Contractor or any other party.
- 9.3.B. Library may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not Defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. When necessary, a deductive Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Library may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from moneys due Contractor, all such claims, costs, losses and damaged caused by or resulting from the correction or removal. If Contractor disagrees with Library's calculations, it may make a claim as provided in Article 12 of this Document 007200. Library's rights under this paragraph 9.3.B shall be entirely discretionary and, like all other Library rights and remedies under the Contract, in addition to any other rights it may have under the Contract Documents or by law.
- 9.3.C. Correction Period:
  - 9.3.C.1. With respect to equipment and machinery supplied by Contractor and incorporated into the Work, if within one year after the date of Substantial Completion of the portion of the Work incorporating the equipment and/or machinery (or, to the extent expressed by Change

Order or Certificate of Substantial Completion, one year after Library's written acceptance of such equipment), or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents (including extended warranties), any equipment or machinery is found to be Defective, Contractor shall promptly, without cost to Library and in accordance with Library's written instructions, correct such Defective Work.

9.3.C.2. With respect to structures within the Scope of Work, if within one year after the date of Substantial Completion of the Work, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to Library and in accordance with Library's written instructions, correct such Defective Work.

9.3.D. Contractor shall remove any Defective Work rejected by Library and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Library may have the Defective Work corrected or the rejected Work removed and replaced.

9.3.E. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, Library shall have all rights and remedies granted by law.

9.3.F. Additionally, in special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that part of Work or that item may start to run from an earlier date if so provided by Change Order or Certificate of Substantial Completion.

9.3.G. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been corrected, removed, or replaced under this provision after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

9.3.H. If following installation of any Work furnished by Contractor, defects requiring correction by Contractor are found, Library shall have the right to operate such Work and make reasonable use thereof until it can be shut down for correction of defects without causing injury to Library.

#### **9.4 Acceptance And Correction Of Defective Work By Library**

9.4.A. Library may accept Defective Work. Contractor shall pay all claims, costs, losses and damages (including but not limited to staff and Consultant time) attributable to Library's evaluation of and determination to accept such Defective Work. If Library accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Library may deduct from moneys due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with Library's calculations, Contractor may make a claim as provided in Article 12 of this Document 007200. If Library accepts any Defective Work after final payment, Contractor shall pay to Library, an appropriate amount as determined by Library.

9.4.B. Library may correct and remedy deficiency if, after 5 Days' written notice to Contractor, Contractor fails to correct Defective Work or to remove and replace rejected Work in accordance with paragraph 9.3.B of this Document 007200; or provide a plan for correction of Defective Work acceptable to Library; or perform Work in accordance with Contract Documents. In connection with such corrective

and remedial action, Library may exclude Contractor from all or part of the Site; take possession of all or part of Work and suspend Contractor's Work related thereto; take possession of all or part of Contractor's tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which Library has paid Contractor but which are stored elsewhere. Contractor shall allow Library, its representatives, agents, employees, and other contractors and Architect's consultants access to the Site to enable Library to exercise the rights and remedies under this paragraph 9.4.B. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by Library in exercising such rights and remedies. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Library may deduct from moneys due Contractor, all claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with Library's calculations, Contractor may make a claim as provided in Article 12 of this Document 007200.

**9.5 Rights Upon Inspection Or Correction**

9.5.A. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by Library of its rights and remedies under this Article 9. Where Library exercises its rights under this Article 9, it retains all other rights it has by law or under the Contract Documents including, but not limited to, the right to terminate for default Contractor's right to proceed with the Work under the Contract Documents and/or make a claim or back charge where a Change Order cannot be agreed upon.

9.5.B. Inspection by Library shall not relieve Contractor of its obligation to have furnished material and workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments or otherwise shall not operate to waive Library's right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of the Work paid therefore. Contractor's obligation to complete the Work in accordance with Contract Documents shall be absolute, unless Library agrees otherwise in writing. Contractor shall immediately correct defective Work upon Contractor's knowledge of the defective Work, regardless of Library's issuance of a correction notice or otherwise identifying the defective Work.

**9.6 Samples And Tests Of Materials And Work**

9.6.A. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, Samples or test specimens of all materials to be used or offered for use in connection with Work. Contractor shall prepare Samples or test specimens at its expense and furnish them to Library. Contractor shall submit all Samples in ample time to enable Library to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

**9.7 Proof Of Compliance Of Contract Provisions**

9.7.A. In order that Library may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of Work and materials, Contractor shall at any time, when requested, submit to Library properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

**9.8 Acceptance**

9.8.A. Inspection by Library or its authorized agents or representatives, any order or certificate for the payment of money, any payment, acceptance of the whole or any part of Work by Library, any extension of time, any verbal statements on behalf of Library or its authorized agents or representatives shall not operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to Library herein or therein or any right to damages provided in the Contract Documents. Any waiver of any breach of the Contract Documents shall not be held

to be a waiver of any other subsequent breach.

## **10 CONTRACTOR'S ORGANIZATION AND EQUIPMENT**

### **10.1 Contractor's Legal Address**

10.1.A. Contractor's address and the facsimile number given in Contractor's Bid are hereby designated as Contractor's legal address and facsimile number. Contractor may change its legal address and facsimile number by notice in writing, delivered to Library, which in conspicuous language advises Library of a change in legal address or facsimile number, and which Library accepts in writing. Delivery of any drawings, notice, letter or other communication to Contractor's legal address or depositing in any post office or post office box regularly maintained by the United States Postal Service, in a wrapper with postage affixed, directed to Contractor at legal address shall be deemed legal and sufficient service thereof upon Contractor. Facsimile to Contractor's designated facsimile number of any letter, memorandum, or other communication on standard or legal sized paper, with proof of facsimile transmission, shall be deemed legal and sufficient service thereof upon Contractor.

### **10.2 Contractor's Office At The Work Site**

10.2.A. Contractor shall maintain an office at the Site, which office shall be headquarters of a Contractor representative authorized to transmit to and receive from Library, communications, instructions or Drawings. Communications, instructions, or Drawings given to Contractor's representative or delivered at the Site office in representative's absence shall be deemed to have been given to Contractor.

### **10.3 Contractor's Superintendents Or Forepersons**

10.3.A. Contractor shall at all times while Work is being performed at site, be represented on Site by a competent resident Superintendent authorized and competent to receive and carry out any instructions that Library may give, and shall be liable for faithful observance of instructions delivered to Contractor. Said Superintendent shall not be replaced without Library's express written consent. The Superintendent shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent shall be as binding as if given to or by Contractor. Communications, instructions, or Drawings given to Contractor's representative shall be deemed to have been given to Contractor.

10.3.B. In the event that the designated Superintendent is unable to be present at the site, Contractor shall designate a substitute Superintendent, subject to Library's approval, and shall obtain Library's consent as to time and duration of any such substitution.

### **10.4 Proficiency In English**

10.4.A. Supervisors, security guards, safety personnel and employees who have unescorted access to the Site shall possess proficiency in the English language in order to understand, receive and carry out oral and written communications or instructions relating to their job functions, including safety and security requirements.

### **10.5 Contractor's And Subcontractors' Employees**

10.5.A. Contractor shall employ, and shall permit its Subcontractors to employ, only competent and skillful personnel to do Work. If Library notifies Contractor that any of its employees, or any of its Subcontractors' employees on Work is incompetent, unfaithful, disorderly or profane, or fails to observe customary standards of conduct or refuses to carry out any provision of the Contract Documents, or uses harassing, threatening or abusive language at the site to any person representing Library or to any member of the public, or violates sanitary rules, or is otherwise unsatisfactory, and if Library requests that such person be discharged from Work, then Contractor or its Subcontractor shall immediately discharge such person from Work and the discharged person shall not be re-employed on the Work except with consent of Library.

**10.6 Contractor To List Trades Working**

10.6.A. Contractor shall list the trades working on the Site and their scheduled activities on a daily basis, and provide a copy of that list to Library.

**10.7 Contractor's Use Of The Site**

10.7.A. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between Library and any owner, former owner or tenant of such land, structure or buildings. Contractor may not occupy Library-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior approval from Library.

**11 PROSECUTION AND PROGRESS OF THE WORK**

**11.1 Schedules And Examinations Of Contract Documents**

11.1.A. Contractor shall submit schedules, reports, and submittals in the appropriate quantity and within the required time, arrange conferences and meetings and proceed with the Work in accordance with Contract Documents, including Sections 013150 (Project Meetings), 013200 (Construction Progress Documentation), and 013300 (Submittal Procedures).

11.1.B. Contractor shall submit to Library for review and discussion:

11.1.B.1. At the Preconstruction Conference described in Section 013150 (Project Meetings), Progress Schedules and Reports as required by Sections 013200 (Construction Progress Documentation) and 013300 (Submittal Procedures). Contractor shall utilize Progress Schedule in planning, scheduling, coordinating, performing and controlling Work (including all activities of Subcontractors, assigned contractors, equipment vendors and suppliers). Contractor shall update Progress Schedule on a monthly basis to depict accurately the actual progress of Work and for evaluating and preparing Contractor's monthly progress payments. Contractor's failure to submit and maintain an acceptable Progress Schedule may, in Library's discretion, and without limiting the materiality of Contractor's other obligations under the Contract Documents, constitute grounds to declare Contractor in material breach of the Contract Documents.

11.1.B.2. Seven (7) Days after Commencement Date, but no later than the Preconstruction Conference (whichever is earlier), a preliminary Schedule of Values conforming to Section 012000 (Price and Payment Procedures) paragraph 1.6.C. See Section 012000 (Price and Payment Procedures) for further requirements regarding the Schedule of Values.

11.1.C. Unless otherwise provided in the Contract Documents, Library will review for acceptability the schedules submitted in accordance with paragraph 11.1.B of this Document 007200. Contractor shall make corrections and adjustments to complete and resubmit the schedules and shall secure Library's written acceptance prior to submitting first payment request. Schedules shall be updated and completed as required by Sections 012000 (Price and Payment Procedures), 013200 (Construction Progress Documentation) and 013300 (Submittal Procedures). No progress or mobilization payment shall be due or owing to Contractor until the schedules are submitted to and acceptable to Library as meeting the requirements of the Contract Documents, including Sections 012000 (Price and Payment Procedures), 013200 (Construction Progress Documentation) and 013300 (Submittal Procedures). Library's acceptance of Contractor's schedules will not create any duty of care or impose on Library any responsibility for the sequencing, scheduling or progress of Work nor will it interfere with or relieve Contractor from Contractor's full responsibility therefore.

## **11.2 Commencement of Work Notification**

11.2.A. Before commencing any portion of Work, Contractor shall inform Library in writing as to time and place at which Contractor wishes to commence Work, and nature of Work to be done, in order that proper provision for inspection of Work may occur, and to assure measurements necessary for record and payment. Information shall be given to Library in a reasonable time in advance of time at which Contractor proposes to begin Work, so that Library may complete necessary preliminary work without inconvenience or delay to Contractor.

## **11.3 Submittals**

11.3.A. Contractor shall submit Submittals to Library (or Architect if Library so designates) for review in strict accordance with Section 013300 (Submittal Procedures). Submission of a Submittal shall constitute Contractor's representation that all requirements of Section 013300 (Submittal Procedures) have been complied with. All Submittals will be identified as Library may require and in the number of copies specified in Section 013300 (Submittal Procedures).

11.3.B. Contractor shall not perform Work that requires submission of a Submittal prior to submission and favorable review of the Submittal. Where a Submittal is required by Contract Documents or the final Schedule of Submittals (if required) accepted by Library, any related Work performed prior to Library's approval of the pertinent Submittal shall be at the sole expense, responsibility, and risk of Contractor.

## **11.4 Contractor To Supply Sufficient Workers And Materials**

11.4.A. Unless otherwise required by Library under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

11.4.B. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then Library may issue a written notice to Contractor, requiring Contractor to accelerate the Work and/or furnish additional qualified workers or materials as Library may consider necessary, at no cost to Library. If Contractor does not comply with the notice within 5 Days of date of service thereof, Library shall have the right (but not a duty) to provide materials and qualified workers to finish the Work or any affected portion of Work, as Library may elect. Library may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate Work elements during the time period that Library exercises this right. Library will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. Library will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of Library from claims of others.

11.4.C. Exercise by Library of the rights conferred upon Library in paragraph 11.4.B of this Document 007200, is entirely discretionary on the part of Library. Library shall have no duty or obligation to exercise the rights referred to in paragraph 11.4.B of this Document 007200 and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of Library's right to exercise such rights in other concurrent or future similar circumstances. The rights conferred upon Library under paragraph 11.4.B of this Document 007200 are cumulative to Library's other rights under any provision of the Contract Documents.

11.4.D. The Library may, if it deems necessary for reasons other than those described in Paragraph 10.6.B, direct Contractor to accelerate the Work by increasing crew sizes, working overtime (as permitted by law) and/or performing shift work. If directed to perform overtime and/or shift work, Contractor will work said overtime and/or shift



work, and the Library shall pay Contractor solely for the additional premium wages paid, plus taxes imposed by law on such additional wages. Unless otherwise directed by the Library, accelerated work shall be performed utilizing the most cost-effective available method. For example, the Library shall not be responsible to pay the premium for overtime work if the same work could have been performed on second shift utilizing a lower premium.

## **11.5 Contractor's Project Data**

- 11.5.A. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Upon Library's request, Contractor shall provide Library with copies of certified payrolls and related documentation. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide Library with a copy of such report upon Library's request and whenever it is generated.
- 11.5.B. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide Library with copies for each Day Contractor works on the Project, to be delivered to Library either the same Day or the following morning before starting Work at the Site. Contractor shall take monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.
- 11.5.C. Library shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. Library and any other applicable governmental entity shall have the right to inspect all information and documents maintained under this paragraph 11.5 at any time during the Project and for a period of five years following Substantial Completion. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.
- 11.5.D. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Construction Change Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to Library for reference. Upon completion of the Work, Contractor shall deliver to Library, the Project Record Documents.

## **12 CLAIMS BY CONTRACTOR/NON-JUDICIAL SETTLEMENT PROCEDURE**

### **12.1 Scope**

- 12.1.A. The claim notice and documentation procedure described in this Article 12 applies to all claims and disputes arising under the Contract Documents, including without limitation any claim or dispute by any Subcontractor or material supplier, and any claims arising under tort law as well as contract law. All Subcontractor and supplier claims of any type shall be brought only through Contractor as provided in this Article 12. Under no circumstances shall any Subcontractor or supplier make any direct claim against Library.
- 12.1.B. "Claim" means a separate written demand, sent by Contractor by registered mail or

certified mail with return receipt requested, seeking, as a matter of right, the payment of money, the adjustment or interpretation of Contract Documents terms, or other relief arising under or relating to Contract Documents. In order to qualify as a “claim,” the written demand must state that it is a claim submitted under this Article 12. A voucher, invoice, proposed change, Application for Payment, cost proposal, RFI, change order request, or other routine or authorized form of request for payment is not a claim under the Contract Documents. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a claim under the Contract Documents by submitting a separate notice and claim in compliance with claim submission requirements herein.

- 12.1.C. The provisions of this Article 12 constitute a non-judicial claim settlement procedure, and also step one of a two-step claim presentment procedure by agreement under Section 930.2 of the California Government Code. Specifically, step one is compliance with this claims procedure and filing/administering timely claims in accordance with the Contract Documents. Step two is filing a timely Government Code Section 910 claim in accordance with the California Government Code. Any Government Code Section 910 claims shall be presented in accordance with the Government Code and shall affirmatively indicate Contractor’s prior compliance with the claims procedure herein and previous dispositions under this Article.
- 12.1.D. The provisions of this Article 12 shall survive termination, breach or completion of the Contract Documents. Contractor shall bear all costs incurred in the preparation and submission of a claim.

## **12.2 Procedure**

- 12.2.A. Disputed Work. Should any clarification, determination, action or inaction by Library, Architect/Engineer, or third party, Work, or any other event whatsoever, in the opinion of Contractor, exceed the requirements of or not comply with Contract Documents in any way, or otherwise result in Contractor seeking additional compensation in time or money or damages for any reason (collectively “Disputed Work”), then Contractor shall so notify Library. Contractor and Library shall make good faith attempts to resolve informally any and all such issues, claims and/or disputes.
- 12.2.B. Duty to Work During Disputes. Notwithstanding any dispute or Disputed Work, Contractor shall continue to prosecute the Work and the Disputed Work in accordance with the determinations of Library. Contractor’s sole remedy for Disputed Work is to pursue the remedies in this Article 12 and follow the determinations of Library.
- 12.2.C. Timely Notice of Disputed Work Required. Before commencing any Disputed Work, or within 10 Days after Contractor’s first knowledge of the Disputed Work, whichever is earlier, Contractor shall file a written notice and preliminary cost proposal for the Disputed Work with Library, stating clearly and in detail its objection and reasons for contending the Disputed Work is outside or in breach of the requirements of Contract Documents. The written notice must identify the subcontractors, vendors, and suppliers affected, if any, sufficient for Library to visit the site to inspect the work and/or conduct a telephonic interview of the persons involved, and/or to photograph the work in question; and Contractor is encouraged to supply digital photographs by email if possible. The preliminary cost proposal must provide a good faith preliminary estimate of the labor (workers, crews), equipment and/or materials involved, and a corresponding good faith preliminary estimate of cost. If a written notice and preliminary cost proposal for Disputed Work is not issued within this time period, or if Contractor proceeds with the Disputed Work without first having given the notice of the Disputed Work, Contractor shall waive its rights to further claim on the specific issue.
- 12.2.D. Timely Notice of Potential Claims Required. Library will review Contractor’s timely notice and preliminary cost proposal for Disputed Work and provide a decision. If, after receiving the decision, Contractor disagrees with it or still considers the Work required of it to be outside of the requirements of Contract Documents, then Contractor shall so notify Library, in writing, within 10 Days after receiving the

decision, by submitting a notice of potential claim, stating that a claim will be issued. (If Library should fail to provide a decision on a notice and preliminary cost proposal within 30 Days, then Contractor shall submit a notice of potential claim within 10 Days following the thirtieth (30th) Day, i.e., by the 40th day following the notice and preliminary cost proposal.) Contractor shall continue to prosecute the Disputed Work to completion.

- 12.2.E. Quarterly Claims Required. At the end of each calendar year quarter (March 31, June 30, September 30 and December 31) of each year, for each and every notice of potential claim that Contractor may have submitted in that quarter, Contractor shall submit a claim in the form specified herein. If a notice of potential claim pertains to Disputed Work that is ongoing at the end of the quarter, Contractor shall file a Potential Claim Update, as described herein, in lieu of the claim referenced in such notice of potential claim. Contractor may defer until the next reporting period the filing of a claim for any notices of potential claim timely issued within the last 15 Days of the prior quarter.

Contractor may file a single consolidated claim each quarter, or may file separate claims each quarter, as Contractor sees fit, provided Contractor complies with the requirements below. The claim(s) shall include all arguments, justification, cost or estimates, schedule analysis, and detailed documentation supporting Contractor's position (further described below). Claims stating that damages, total damages (direct and indirect), schedule impact and/or any time extension will be determined at a later date shall not comply with this subparagraph and shall result in Contractor waiving its claim(s).

Contractor shall also maintain a continuing "claims log" that shall list all outstanding claims and their value, and provide such log to Library quarterly.

- 12.2.F. Quarterly Updates to Notices of Potential Claims Required. If Disputed Work for which a notice of potential claim has been filed continues beyond the end of the calendar quarter, then Contractor shall, every quarter until the Disputed Work ceases, submit to Library a document titled "Potential Claim Update" that shall update and quantify all elements of the potential claim as completely as possible, including damages (direct and indirect), schedule impact and/or any time extension to date. Contractor's failure to submit a Potential Claim Update, or to quantify damages (direct and indirect), schedule impact and/or any time extension to date, in any quarter shall result in waiver of the claim for such quarter. Potential Claim Updates stating that damages (direct and indirect), schedule impact and/or any time extension to date will be determined at a later date shall not comply with this subparagraph and shall result in Contractor waiving its claim(s) for each quarter in which such Potential Claim Updates were submitted. At the end of the quarter in which the Disputed Work is completed, Contractor shall submit a claim as provided herein.

- 12.2.G. Claim Negotiations Required. Upon receipt of Contractor's claim including all arguments, justifications, cost or estimates, schedule analysis, and documentation supporting its position as required herein, Library or its designee will review the issue and render a determination within 45 Days of submission, or such longer period as may be allowed pursuant to section 9204 of the Public Contract Code. Before rendering a determination, Library may in its discretion conduct an administrative hearing on Contractor's claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further document, schedules or analysis requested by Library to evaluate and decide Contractor's claim. Should Library take no action on the claim within 45 Days of submission, or such longer period as may be allowed pursuant to section 9204 of the Public Contract Code, it shall be deemed denied. Consistent with Public Contract Code section 9204, if Library takes any action on the claim, it will provide Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Library shall tender any payment due to Contractor on any undisputed portion of a claim within 60 Days after Library issues its written statement.

If Contractor disputes Library's written response, or if Library fails to respond to a

claim tendered pursuant to this Article 12 within the time period prescribed, Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, Library will schedule a meet and confer conference within 30 Days for settlement of the dispute. Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, Library will provide Contractor with a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim will be tendered within 60 Days after Library issues its written statement. Any disputed portion of the claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with Library and Contractor sharing the associated costs equally. Library and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to the remaining procedures required by this Article 12.

At the time any disputed claim or portion of a claim is submitted to nonbinding mediation, all other claims and portions of claims that remain in dispute shall also be submitted for the same mediation, provided that each has been discussed at a meet and confer conference and has not already been submitted to mediation.

Contractor and Library may mutually agree upon a written waiver of mediation, claims resolution protocols, neutral facilitators or mediators, or other alternative dispute resolution procedures, as appropriate and consistent with the Public Contract Code, including Sections 9204 and 20104 *et seq.*

- 12.2.H. If a claim submitted in accordance with this Article 12 totals less than \$375,000, then claims resolution shall proceed in a manner consistent with Public Contract Code Sections 9204 and 20104, *et seq.*
- 12.2.I. Notwithstanding and pending the resolution of any claim or dispute, Contractor shall diligently prosecute the Disputed Work to final completion in accordance with Library's determination.
- 12.2.J. If Contractor is not satisfied with the resolution of Contractor's claim pursuant to completion of the non-judicial process set forth above, then Contractor is required to comply with Government Code Section 910 and other requirements of the Government Claims Act (Government Code Sections 815, *et seq.*), to continue to pursue any claim against the Library.

### **12.3 Subcontractor Claims**

Contractor shall present as its claims all Subcontractor, sub-Subcontractor and supplier claims of any type, and prove them under the terms of the Contract Documents. Library shall not be directly liable to any Subcontractor, any supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages or extra costs of any type arising out of or resulting from the Project.

### **12.4 Waiver**

- 12.4.A. If Contractor fails to comply with this Article 12 as to any claim, then Contractor shall waive its rights to such claim.
- 12.4.B. All claim(s), Disputed Work items or issue(s) not raised in a timely notice, timely notice of potential claim or timely claim submitted under this Article 12, may not be asserted in any subsequent Government Code section 910 claim, litigation or legal action.
- 12.4.C. Contractor may request an extension of time to comply with the claims procedure herein, but must do so in advance of time periods expiring and Library must give its approval in writing (which approval may be withheld by Library in its sole discretion.)

As to any other feature of the claim procedure herein (and its claims waiver feature), it may not be waived or altered absent a written change order signed by both parties and approved as to form by their legal counsel.

- 12.4.D. Library shall not be deemed to waive or alter any provision under this Article 12, if at Library's sole discretion, a claim is administered in a manner not in accord with this Article 12.

## **13 LEGAL AND MISCELLANEOUS**

### **13.1 Laws And Regulations**

- 13.1.A. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall protect and indemnify Library and its officers, employees, consultants and agents against any claim or liability, including attorney's fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders.
- 13.1.B. Whenever Drawings and Specifications require higher standards than are required by any applicable law, ordinance, regulation or order, Drawings and Specifications shall govern. Whenever Drawings and Specifications require something that will violate such laws, ordinances, regulations or orders, then such laws, ordinances, regulations or orders shall govern.
- 13.1.C. Contractor shall comply with applicable portions of Title 8 (Industrial Relations), Title 19 (Public Safety), Title 22 (Social Security, Division of Health) and Title 24 (California Building Standards Code), California Code of Regulations (Uniform Building Code) (most recent edition), Public Contract Code. Whenever Contract Documents require larger sizes or higher standards than are required by any applicable law, ordinance, regulation or order, Contract Documents shall govern. Whenever Contract Documents require something that will violate such laws, ordinances, regulations or orders, then such laws, ordinances, regulations or orders shall govern.

### **13.2 Permits And Taxes**

- 13.2.A. Library will pay applicable building permits, school, sanitation and water demand fees, except as otherwise provided in Section 011000 (Summary). Unless otherwise noted in Section 011000 (Summary), Contractor shall procure all permits and licenses applicable to the Work (including environmental matters to the extent applicable); pay all charges and fees, including fees for street opening permits; comply with, implement and acknowledge effectiveness of all permits; initiate and cooperate in securing all required notifications or approvals therefore; and give all notices necessary and incident to due and lawful prosecution of Work. Contractor shall pay all fees related to deferred submittals such as, but not limited to, fire sprinkler system, underground utilities, fuel storage tank and fire alarm system. Contractor shall pay all sales and/or use taxes levied on materials, supplies, or equipment purchased and used on or incorporated into Work, and all other taxes properly assessed against equipment or other property used in connection with Work, without any increase in the Contract Sum. Contractor shall make necessary arrangements with proper authorities having jurisdiction over roads, streets, pipelines, navigable waterways, railroads, and other works in advance of operations, even where Library may have already obtained permits for the Work.

### **13.3 Suspension Of Work**

- 13.3.A. Library may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as Library may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in Section 012600 (Contract Modification

- Procedures). No adjustment shall be made to extent that:
- 13.3.B. Performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or
  - 13.3.C. An equitable adjustment is made or denied under any other provision of Contract Documents; or
  - 13.3.D. The suspension of Work was the direct or indirect result of Contractor's failure to perform any of its obligations hereunder. Adjustments made in cost of performance may have a mutually agreed fixed or percentage fee; if the parties cannot agree, Contractor may file a claim under Article 12 of this Document 007200.

#### **13.4 Termination Of Contract For Cause**

- 13.4.A. Library may declare Contractor in default of Contract Documents and Library may terminate Contractor's right to proceed under the Contract Documents for cause:
  - 13.4.A.1. Should Contractor make an assignment for the benefit of creditors; admit in writing its inability to pay its debts as they become due; file a voluntary petition in bankruptcy; be adjudged as bankrupt or insolvent; be the subject of an involuntary petition in bankruptcy which is not dismissed within 60 Days; file a petition or answer seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any present or future statute, law, or regulation; file any answer admitting or not contesting the material allegations of a petition filed against Contractor in any such proceeding; or seek, consent to, or acquiesce in, the appointment of any trustee, receiver, custodian or liquidator of Contractor or of all or any substantial part of its properties or if Contractor, its directors or shareholders, take action to dissolve or liquidate Contractor; or
  - 13.4.A.2. Should Contractor commit a material breach of the Contract Documents. If Library declares Contractor in default due to material breach, however, Library must allow Contractor an opportunity to cure such breach within 10 Days of the date of notice from Library to Contractor providing notice of the default; or, if such breach is curable but not curable within such 10-Day period, within such period of time as is reasonably necessary to accomplish such cure; or
  - 13.4.A.3. Should Contractor violate or allow (by a Subcontractor or other person or entity for which Contractor is responsible) a violation of any valid law, statute, regulation, rule, ordinance, permit, license or order of any governmental agency applicable to the Project or Work and does not cure (or cause to be cured) such violation within 10 Days of the date of the notice from Library to Contractor demanding such cure; or, if such violation is curable but not curable within such 10-Day period, within such period of time as is reasonably necessary to accomplish such cure.
- 13.4.B. Contractor may avail itself of a time period in excess of the 10-Day periods provided in paragraphs 13.4.A.2 and 13.4.A.23 if, within that 10-Day period, Contractor provides Library with a written plan to cure said breach or violation which is acceptable to the Library. Such a plan may include, for example, evidence of necessary resources, Subcontractor commitments, schedules and recovery schedules meeting Contract Document requirements, and showing a realistic and achievable plan to cure the breach or violation. Contractor must then diligently commence and continue such cure according to the written plan.
- 13.4.C. If Library at any time reasonably believes that Contractor is or may be in default under the Contract Documents as provided in paragraph 13.4.A, then Library may in its sole discretion notify Contractor of this fact and request written assurances from Contractor of performance of the Contract Documents and a written plan from Contractor to remedy any default. Contractor shall, within 10 Days of Library's request, deliver a written cure plan which meets the requirements of the written plan

deliverable under paragraph 13.4.A.2. Failure of Contractor to provide such written assurances of performance and the required written plan, within 10 Days of Library's request, will constitute a material breach of the Contract Documents sufficient to justify termination for cause.

13.4.D. In event of termination for cause, Library will immediately serve written notice thereof upon Surety and Contractor. Surety shall have the rights and obligations set forth in Document 006113.13 (Performance Bond). Subject to the Surety's rights under the Performance Bond (which rights are waived upon a default thereunder), Library may take over the Work and prosecute it to completion by contract or by any other methods it may deem advisable.

13.4.E. In the event of termination for cause by Library as provided in paragraph 13.4.A:

13.4.E.1. Library will compensate Contractor for the value of the Work delivered to Library upon termination as determined in accordance with the Contract Documents, subject to all rights of offset and back charges, and provided that Contractor provides Library with updated as-builts and Project Record Documents showing the Work performed up to the date of termination. However, Library will not compensate Contractor for its costs in terminating the Work or any cancellation charges owed to third parties.

13.4.E.2. Contractor shall deliver to Library possession of the Work in its then condition including, but not limited to, all designs, engineering, Project records, Project Record Documents, cost data of all types, Drawings and Specifications and contracts with vendors and Subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the date of such termination to comply with the provisions of the Contract Documents. The provisions of this paragraph 13.4.E shall not be interpreted to diminish any right which Library may have to claim and recover damages for any breach of Contract Documents or otherwise, but rather, Contractor shall compensate Library for all loss, cost, damage, expense, and/or liability suffered by Library as a result of such termination and failure to comply with Contract Documents.

13.4.F. Library's rights under paragraph 13.4.E.2 shall be specifically enforceable to the greatest extent permitted by law. Library shall, to the extent applicable, have all other rights and remedies set forth in any Contract Document.

13.4.G. Library may terminate portions or parts of the Work for cause, provided these portions or parts (i) have separate geographic areas from parts or portions of the Work not terminated or (ii) are limited to the Work of one or more specific trades or Subcontractors. In such case, Contractor shall cooperate with other contractors as required under Article 6 of this Document 007200.

13.4.H. In the event a termination for cause is determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, and Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor claim arising out of a termination for cause shall be made in accordance with Article 12 of this document and calculated in accordance with the provisions of the Contract Documents on Change Orders and claims. No other loss cost, damage, expense or liability may be claimed, requested or recovered by Contractor.

### **13.5 Termination Of Contract For Convenience**

13.5.A. Library may terminate performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever Library

shall determine that termination is in Library's best interest. Termination shall be effected by Library delivering to Contractor notice of termination specifying the extent to which performance of the Work under the Contract Documents is terminated and the effective date of the termination.

13.5.B. After receiving a notice of termination under paragraph 13.5.A, and except as otherwise directed by Library, Contractor shall:

13.5.B.1. Stop Work under the Contract Documents on date and to extent specified in notice of termination;

13.5.B.2. Place no further orders or subcontracts for materials, services, or facilities except as necessary to complete portion of Work under the Contract Documents which is not terminated;

13.5.B.3. Terminate all orders and subcontracts to extent that they relate to performance of Work terminated by the notice of termination;

13.5.B.4. Assign to Library in manner, at times, and to extent directed by Library, all right, title, and interest of Contractor under orders and subcontracts so terminated. Library shall have the right, in its sole discretion, to settle or pay any or all claims arising out of termination of orders and subcontracts;

13.5.B.5. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with approval or ratification of Library to extent Library may require. Library's approval or ratification shall be final for purposes of this paragraph 13.5;

13.5.B.6. Transfer title to Library, and deliver in the manner, at the times, and to the extent, if any, directed by Library, all fabricated or unfabricated parts, Work in process, completed Work, supplies, and all other material produced as part of, or acquired in connection with performance of, Work terminated by the notice of termination, and completed or partially completed drawings, drawings, specifications, information, and other property which, if the Project had been completed, would have been required to be furnished to Library;

13.5.B.7. Use its best efforts to sell, in manner, at times, to extent, and at price or prices that Library directs or authorizes, any property of types referred to in paragraph 13.5.B.6, but Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under conditions prescribed and at price or prices approved by Library. Proceeds of transfer or disposition shall be applied to reduce payments to be made by Library to Contractor under the Contract Documents or shall otherwise be credited to the price or cost of Work covered by Contract Documents or paid in such other manner as Library may direct;

13.5.B.8. Complete performance of the part of the Work which was not terminated by the notice of termination; and

13.5.B.9. Take such action as may be necessary, or as Library may direct, to protect and preserve all property related to Contract Documents which is in Contractor's possession and in which Library has or may acquire interest.

13.5.C. After receipt of a notice of termination under paragraph 13.5.A, Contractor shall submit to Library its termination claim, in form and with all certifications required by Article 12 of this Document 007200. Contractor's termination claim shall be submitted promptly, but in no event later than 6 months from effective date of the termination. Contractor and Library may agree upon the whole or part of the amount or amounts to be paid to Contractor because of a total or partial termination of Work under this paragraph 13.5. If Contractor and Library fail to agree on the whole amount to be paid to Contractor because of the termination of the Work under this paragraph 13.5, Library's total liability to Contractor by reason of the termination shall be the total (without duplication of any items) of:



- 13.5.C.1. The reasonable cost to Contractor, without profit, for all Work performed prior to the effective date of the termination, including Work done to secure the Project for termination. Reasonable cost may not exceed the applicable percentage completion values derived from the Progress Schedule and the schedule of values. Deductions shall be made for cost of materials to be retained by Contractor, cost of Work defectively performed, amounts realized by sale of materials, and for other appropriate credits against cost of Work. Reasonable cost will include reasonable allowance for Project overhead and general administrative overhead not to exceed a total of ten percent of direct costs of such Work. When, in Library's opinion, the cost of any item of Work is excessively high due to costs incurred to remedy or replace Defective or rejected Work, reasonable cost to be allowed will be the estimated reasonable cost of performing the Work in compliance with requirements of Contract Documents and excessive actual cost shall be disallowed.
- 13.5.C.2. A reasonable allowance for profit on cost of Work performed as determined under paragraph 13.5.C.1, provided that Contractor establishes to Library's satisfaction that Contractor would have made a profit had the Project been completed, and provided further that the profit allowed shall not exceed 5 percent of cost.
- 13.5.C.3. Reasonable costs to Contractor of handling material returned to vendors, delivered to Library or otherwise disposed of as directed by Library.
- 13.5.C.4. A reasonable allowance for Contractor's internal administrative costs in preparing termination claim.
- 13.5.C.5. Except as provided in this paragraph 13.5.C, Library shall not be liable for costs incurred by Contractor or Subcontractors after receipt of a notice of termination. Such non-recoverable costs include, but are not limited to, anticipated profits on Work not performed as of the date of termination, post-termination employee salaries, post-termination general administrative expenses, post-termination overhead or unabsorbed overhead, costs of preparing and submitting Contractor's Bid, attorney's fees of any type, and all costs relating to prosecution of claim or lawsuit.
- 13.5.D. Library shall have no obligation to pay Contractor under this paragraph 13.5 unless and until Contractor provides Library with updated and acceptable as-builts and Project Record Documents for Work completed prior to termination.
- 13.5.E. In arriving at the amount due Contractor under this clause, there shall be deducted:
  - 13.5.E.1. All unliquidated advances or other payments on account previously made to Contractor which are applicable to the terminated portion of Contract Documents;
  - 13.5.E.2. Any claim which Library may have against Contractor in connection with Contract Documents; and
  - 13.5.E.3. The agreed price for, or proceeds of sale of, any materials, supplies, or other things kept by Contractor or sold under provisions of this paragraph 13.5, and not otherwise recovered by or credited to Library.

**13.6 Contingent Assignment Of Subcontracts**

- 13.6.A. Contractor hereby assigns to Library each Subcontract for a portion of the Work, provided that:
  - 13.6.A.1. The assignment is effective only after Library's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) pursuant to paragraphs 13.4 or 13.5 of this Document 007200.
  - 13.6.A.2. The assignment is effective only for the Subcontracts which Library

- expressly accepts by notifying the Subcontractor in writing;
- 13.6.A.3. The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 006113.13 (Performance Bond Form) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;
  - 13.6.A.4. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense (except as otherwise provided in paragraphs 13.4 or 13.5 of this Document 007200), sign all instruments and take all actions reasonably requested by Library to evidence and confirm the effectiveness of the assignment in Library; and
  - 13.6.A.5. Nothing in this paragraph 13.6 shall modify or limit any of Contractor's obligations to Library arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

### **13.7 Remedies and Contract Integration**

- 13.7.A. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter-claims, disputes and other matters in question between Library and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the applicable court of competent jurisdiction located in the State of California, County of Sonoma. All Library remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances Library shall have any and all other equitable and legal rights and remedies which it would have according to law.
- 13.7.B. The Contract Documents, any Contract Modifications, and Change Orders shall represent the entire and integrated agreement between Library and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties' agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written Modifications. Library and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written Modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications and the parties are not and will not rely on any other information.
- 13.7.C. In any proceeding to enforce the Contract Documents, Contractor and Library agree that the finder of fact shall receive detailed instructions on the meaning and operation of the Contract Documents, including their conditions, limitations of liability and remedies clauses, claims procedures and any other provisions impacting major defenses and theories of liability of the parties. Detailed findings of fact shall be requested, to verify Contract enforcement.
- 13.7.D. Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

### **13.8 Patents**

- 13.8.A. Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work.
- 13.8.B. Contractor shall defend, indemnify and hold harmless Library and each of its officers, employees, consultants and agents, including, but not limited to, the Commission and

each Library Representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney's fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons, or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnitees include, but are not limited to, any and all license fees, whether such fees are agreed by any indemnitee or ordered by a court or administrative body of any competent jurisdiction.

**13.9 Substitution For Patented And Specified Articles**

13.9.A. Except as noted specifically in Specifications, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words "or Approved Equal" and Contractor may offer any substitute material or process that Contractor considers "equal" in every respect to that so designated and if material or process offered by Contractor is, in opinion of Library, Equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00660 (Substitution Request Form) as provided in Document 002113 (Instructions to Bidders). A substitution will be approved only if it is a true Equal item in every aspect of its design and quality, including but not limited to its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

**13.10 Interest Of Public Officers**

No representative, commissioner, officer, or employee of Library, no member of the governing body of the locality in which the Project is situated, no member of the locality in which Library was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the Project, during the tenure of the official or for one year thereafter, shall, as principal, agent, attorney or otherwise, be directly or indirectly interested, in the Contract Documents or the proceeds thereof.

**13.11 Limit Of Liability**

LIBRARY, AND EACH OF ITS OFFICERS, COMMISSION MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, BUT NOT LIMITED TO, ARCHITECT AND EACH OTHER LIBRARY REPRESENTATIVE, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

**13.12 Severability**

Any provisions or portions thereof of Contract Documents that are prohibited by, unlawful, or unenforceable under any applicable law of any jurisdiction shall as to such jurisdiction be ineffective without affecting other provisions or portions thereof in the Contract Documents.

**14 MODIFICATIONS OF CONTRACT DOCUMENTS**

**14.1 Alterations, Modifications And Force Account Work**

14.1.A. No modification or deviation from the Drawings and Specifications will be permitted except by written Contract Modification.

14.1.B. Library may, without notice to the sureties, make alterations, deviations, additions to, or deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, contract or otherwise change the Contract Time; delete any item or portion of the Work; and/or require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless

specifically provided otherwise at the time the change is ordered. In the case of any ordered extra Work, Library reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such Library-furnished labor, materials, and equipment.

- 14.1.C. If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the Work, the price fixed in the Contract Documents shall be increased or decreased as set forth in a written Change Order by the amount that Contractor and Library may agree upon as a reasonable and proper allowance for the cost increase or decrease. If an agreement cannot be reached, then Library will reach a determination, which shall be final, subject to Contractor's rights under Article 12 of this Document 007200. In all cases, Contractor shall perform the changed Work as directed by Library subject to Contractor's rights under Article 12 of this Document 007200.
- 14.1.D. A Change Order will become effective when signed by Library. If Library exercises its right to decide disputed issues pertaining to changed Work as set forth in Articles 12 and 14 of this Document 007200, then the resulting Change Order shall be effective when signed by Library, notwithstanding that Contractor has not signed it.
- 14.1.E. Changes not affecting the Contract Time or Contract Sum of the Work, in Library's discretion, may be set forth in a written RFI-Reply executed by Library or Architect's Supplemental Instruction (ASI). Execution of such an RFI-Reply or ASI constitutes Contractor's agreement to make the specified change without change to the Contract Sum or the Contract Time.
- 14.1.F. Changes or deviations from Contract Documents affecting the Contract Time or Contract Sum of the Work shall not be made without the authority of an effective Change Order or Construction Change Directive as provided in Section 012600 (Contract Modification Procedures), except in cases of emergency discussed in Article 15 of this Document 007200.
- 14.1.G. Changes in the Work made pursuant to this Article 14 and extensions of Contract Time necessary by reason thereof shall not in any way release the guarantees and warranties given by Contractor pursuant to provisions of the Contract Documents, nor shall such changes in the Work relieve or release the Sureties of bonds executed pursuant to said provisions. The Sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of time made by reason thereof.
- 14.1.H. Procedures for Modifications of Contract Documents and for calculating the cost of extra Work are given in Section 012600 (Contract Modification Procedures). Regarding delay and impact costs of any nature, Contractor may not seek delay compensation for on-Site or off-Site costs based on formulas, e.g., "Eichlay" or other formula. Rather, Contractor shall prove actual costs resulting from such delays. If Contractor requests compensation for delay to the construction, then Contractor shall prove and document actual costs plus markup per the cost categories and procedures in Section 012600 (Contract Modification Procedures) in order to request, claim or prove compensation for delay.

## **14.2 Time Allowances**

- 14.2.A. The Contract Time may only be changed by Change Order or by Contract Modification, and all time limits stated in the Contract Documents are of the essence of Contract Documents.
- 14.2.B. The Contract Time will be adjusted in an amount equal to the time lost or added due to:
  - 14.2.B.1. Changes in the Work ordered by Library;
  - 14.2.B.2. Acts or neglect by Library, Architect, any Library Representative, utility owners or other contractors performing other work, provided that Contractor has fully and completely performed its responsibilities under the Contract Documents; or
  - 14.2.B.3. Fires, floods, epidemics, abnormal weather conditions beyond the

parameters otherwise described or referenced in paragraph 14.4 below, earthquakes, civil or labor disturbances, strikes or acts of God, provided damages resulting therefrom are not the result of Contractor's failure to protect the Work as required by Contract Documents.

14.2.C. The Contract Time shall not be extended for any cause identified in paragraph 14.2.B above, however, unless:

14.2.C.1. Contractor actually has been prevented from completing any part of the Work within the Contract Time due to delay that is beyond Contractor's control and due to reasons for which Contractor is not responsible (delays attributable to and within the control of a Subcontractor, or its subcontractors, or supplier shall be deemed to be delays within the control of Contractor);

14.2.C.2. A claim for delay is made as provided herein; and

14.2.C.3. Contractor submits a Time Impact Evaluation as required under Section 013200 (Construction Progress Documentation) that demonstrates actual delay to critical Work activities that actually delay the progress of the Work in the amount of time requested.

### **14.3 Notice Of Delay**

14.3.A. Within 7 Days of the beginning of any delay, Contractor shall notify Library in writing, by submitting a notice of potential claim, of all anticipated delays resulting from the delay event in question. Any request for extension of time shall be accompanied by Contractor's written statement that the adjustment claimed is the entire adjustment to which the claimant is entitled as a result of the occurrence of said event, and shall include a written schedule document that demonstrates delay to the critical path using a Time Impact Evaluation as specified in Document 013200 (Construction Progress Documentation). Library will determine all claims and adjustments in the Contract Time. No claim for an adjustment in the Contract Time will be valid and such claim will be waived if not submitted in accordance with the requirements of this paragraph 14.3.A.

### **14.4 Non-Compensable Time Extensions; Adverse Weather Parameters**

14.4.A. Where Contractor is prevented from completing any part of the Work within the Contract Time due to delay beyond the reasonable control of Contractor and Library (such as for conditions specified in paragraph 14.2.B.3), an extension of Contract Time, in an amount equal to the time lost due to such delay (without compensation), shall be Contractor's sole and exclusive remedy for such delay.

14.4.B. The adverse weather contingency for this Contract is provided in Document 007300 (Supplementary Conditions). Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the Contract's adverse weather contingency, nor will Contractor be entitled to any extension of Contract Time for any such delays. Contractor shall be entitled to an extension of Contract Time for adverse weather only if: (i) the number of workdays of adverse weather, recognize as provided in this paragraph 14.4, exceeds these parameters; (ii) Contractor proves that adverse weather actually caused delays to Work that is on the critical path; and (iii) Contractor satisfies the other requirements of this paragraph 14.4.

14.4.C. To qualify as an adverse weather day with respect to the foregoing parameters, daily rainfall must exceed 0.1 of an inch or more at the National Oceanic & Atmospheric Administration weather station identified in Document 007300 (Supplementary Conditions), and Contractor must give Library written notice of its intent to claim an adverse weather day within one Day of the adverse weather day occurring. Contractor shall at all times employ all available mitigation measures to enable Work to continue.

14.4.D. Contractor shall include the foregoing rain parameters as in its Progress Schedule as required in Section 013200 (Construction Progress Documentation). As Work on the

critical path is affected by rain, Contractor shall notify Library and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float.

- 14.4.E. Subject to the other requirements of this paragraph, adverse weather days shall be recognized for the actual number of days Contractor proves it was delayed by adverse weather. For example, and not by way of limitation, if rain exceeding the amount described in paragraph 14.4.C does not in fact delay Contractor's progress on the critical path, then no adverse weather days shall be recognized. Conversely, if Contractor proves that rain exceeding the amount described in paragraph 14.4.C causes delay to Contractor for a period longer than the number of rain days incurred (e.g., if it rains during grading Work), then all such days shall be recognized as adverse weather days.
- 14.4.F. Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, lime treatment, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for Library to not recognize adverse weather days, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.

#### **14.5 Compensable Time Extensions**

- 14.5.A. Contractor may receive a time extension and be compensated for delays caused directly and solely by Library. Provided Contractor provides proper notice and documentation under Document 013200, such compensation may include extended field or home office overhead, field supervision, escalation charges, acceleration costs and extended subcontractor costs.
- 14.5.B. Contractor shall not be entitled to any time extension or compensation for any delays caused in whole or in part by Contractor's failure to perform its obligations under the Contract Documents, or during periods of delay concurrently caused by Contractor and either Library or others.
- 14.5.C. Contractor shall not be entitled to damages for delay to the Work caused by the following reasons:
  - 14.5.C.1. Library's right to sequence the Work in a manner which would avoid disruption to Library's operations, contractors (and their subcontractors), and Library's employees, exercised as a result of Contractor's failure to perform its cooperation and coordination responsibilities required by Contract Documents; Library's enforcement of any government act or regulation; or the provisions of the Contract Documents; and
  - 14.5.C.2. Extensive requests for clarifications to Contract Documents or Contract Modifications thereto, provided such clarifications or Contract Modifications are processed by Library or its consultants in a reasonable time commensurate with Contract Documents requirements.

#### **14.6 Liquidated Damages**

- 14.6.A. Time is of the essence. Execution of Contract Documents by Contractor shall constitute acknowledgement by Contractor that Contractor understands, has ascertained and agrees that Library will actually sustain damages in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion or extensions of time allowed pursuant to provisions hereof. Contractor and Library agree that specified measures of liquidated damages shall be presumed to be the damages actually sustained by Library as defined below, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.
- 14.6.B. Liquidated damages shall be considered not as a penalty but as agreed monetary damage sustained by Library for increased Project administration expenses, including extra inspection, construction management, architectural and engineering expenses and Library staffing costs related to the Project and Contract Documents

because Contractor failed to perform and complete Work within time fixed for completion or extensions of time allowed pursuant to provisions hereof. Liquidated damages shall not be deemed to include within their scope additional damages or administrative costs arising from Defective Work, lost revenues, interest expenses, cost of completion of the Work, cost of substitute facilities, claims and fines of regulatory agencies, damages suffered by others or other forms of liability claimed against Library as a result of delay (e.g., delay or delay-related claims of other contractors or subcontractors), and defense costs thereof. Contractor shall be fully responsible for the actual amount of any such damages it causes, in addition to the liquidated damages otherwise due Library.

14.6.C. Library may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages. Should Contractor fall behind the approved Progress Schedule, Library may deduct liquidated damages based on its estimated period of late completion. Library need not wait until Final Completion to withhold liquidated damages from Contractor's progress payments. Should money due or to become due to Contractor be insufficient to cover aggregate liquidated damages due, then Contractor forthwith shall pay the remainder of the assessed liquidated damages to Library.

#### **14.7 Differing Site Conditions**

14.7.A. If Contractor encounters underground conditions that exceed the scope of the Work, Contractor shall promptly give Library written notice of the condition, and shall give such notice before the conditions are disturbed, to include: (i) material that 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, and is not within the scope of Work ("hazardous waste"); (ii) 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, that Contractor did not and could not have known about by performing its required pre-Bid investigations; or (iii) unknown physical conditions at the Site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for the Contract, that Contractor did not and could not have known about by performing its required pre-Bid investigations.

14.7.B. Library shall promptly investigate the underground conditions, and if it finds that (i) the conditions do materially so differ in a manner Contractor did not anticipate and could not have anticipated, or do involve hazardous waste outside the scope of the Work, and (ii) cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, then Library shall initiate a change order under the procedures described in the contract, including but not limited to, issuing either a Request for Proposal or a Construction Change Directive under the procedures described in the Contract Documents, including without limitation Document 012600 (Contract Modification Procedures).

14.7.C. If Library determines that underground conditions at the Site do not materially so differ in a manner Contractor did not anticipate and could not have anticipated, or do not involve hazardous waste outside the scope of the Work, or do not cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, or for any other reason that that no change in terms of the Contract Documents is justified, Library will so notify Contractor in writing, stating reasons.

14.7.D. In the event that a dispute arises between Library and Contractor whether the conditions do materially so differ, or involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, 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. Contractor shall retain any and all rights provided either by the

- Contract or by law which pertain to the resolution of disputes and protests between contracting parties.
- 14.7.E. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials, claimed Latent or materially different Site conditions (whether above or below grade) if:
- 14.7.E.1. Contractor knew of the existence of such conditions at the time Contractor submitted its Bid; or
- 14.7.E.2. Contractor should have known of the existence of such conditions at the time Contractor submitted its Bid, or should have learned of such conditions and mitigated their impact, as a result of having complied with the requirements of Contract Documents, including without limitation, the investigation requirements herein at Articles 2 and 10 of Document 007200;
- 14.7.E.3. The information or conditions claimed by Contractor to be Latent or materially different consist of information, conclusions, opinions or deductions made from underground conditions reports, of the kind that this Document 007200 precludes reliance upon; or
- 14.7.E.4. Contractor was required to give written notice and failed to do so within the time required.
- 14.7.F. If, because of a differing site condition as defined herein, Contractor does not agree to continue with Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, Library may order the disputed portion of Work deleted from the Work, or performed by others, or Library may invoke its right to terminate Contractor's right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant. If Contractor does not agree with Library's determination of any adjustment in the Contract Sum or Contract Time as a result, Contractor may make a claim as provided in Article 12 of this Document 007200.

#### **14.8 Change Orders Related to Underground Facilities**

- 14.8.A. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by Library, is not on file at the "Underground Service Alert" regional notification center, or reasonably known to Contractor by performing its obligations in Articles 2 and 10 of this Document 007200, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than 7 Days), and prior to performing any Work in connection therewith (except in an emergency as required by Article 15 of this Document 007200), identify the owner of such Underground Facility and give written notice to that owner and to Library. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- 14.8.B. Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, for Underground Facilities either not shown or inaccurately shown in the Contract Documents, the information supplied pursuant to Document 003119 (Existing Condition Information), or in information on file at the "Underground Service Alert" regional notification center, only where the inaccuracy was (i) material and outside of the normal experience on projects of this nature, (ii) was not reasonably inferable from existing information, and (iii) directly results in a material, justifiable and actual increase in the cost of Contractor's work. For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, or if the Underground Facility could be determined or its cost impact mitigated by performing the obligations in Articles 2 and/or 10 of this Document 007200, then an increase in the Contract Price or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated or was shown at a different place or a different elevation in the Contract Documents, in the information supplied to Contractor pursuant to Document 003119 (Existing Conditions Information ), or in information otherwise on file and available to



Contractor.

- 14.8.C. Main Line and Trunk Line Utilities (Government Code Section 4215). Consistent with Government Code Section 4215, as between Library and Contractor, Library will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or Document 003119 (Existing Condition Information). Library will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or Document 003119 (Existing Condition Information) with reasonable accuracy, and equipment on the Project necessarily idled during such work.

## **15 WORKING CONDITIONS AND PREVAILING WAGES**

### **15.1 Use Of Site/Sanitary Rules**

- 15.1.A. All portions of the Work shall be maintained at all times in neat, clean and sanitary condition. Contractor shall furnish toilets for use of Contractor's and Subcontractors' employees on the Site where needed, and their use shall be strictly enforced. All toilets shall be properly secluded from public observation, and shall be located, constructed and maintained subject to Library's approval.
- 15.1.B. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land areas identified in and permitted by Contract Documents and other land and areas permitted by applicable laws and regulations, rights of way, permits and easements or as designated by Library, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, any improvement located thereon, or to the Library or occupant thereof resulting from the performance of Work.
- 15.1.C. During the progress of the Work, Contractor shall keep the Site and the Project free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the Site as well as all tools, appliances, construction equipment and machinery and surplus materials. Contractor shall leave the premises clean and ready for occupancy by Library at Substantial Completion of Work. Contractor shall restore to original condition all property not designated for alteration by Contract Documents.
- 15.1.D. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigation regarding structural, mechanical, electrical or any other system existing, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

### **15.2 Protection Of Work, Persons, And Property**

- 15.2.A. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with Work. Contractor shall comply with all safety requirements specified in any safety program established by Library, or required by state, federal or local laws and ordinances. Contractor shall be responsible for all damage to Work, property or structures, and all injuries to persons, arising from the performance of Work of the Contract Documents.
- 15.2.B. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss, and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect

them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

- 15.2.C. Contractor shall remedy all damage, injury or loss to any property referred to in paragraph 15.2.A which is caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work, or anyone for whose acts any of them may be liable. Contractor's duties and responsibilities for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. Library and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor's Work.
- 15.2.D. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- 15.2.E. Library may, at its option, retain such moneys due under the Contract Documents as Library deems necessary until any and all suits or claims against Contractor for injury to persons or property shall be settled and Library receives satisfactory evidence to that effect.

### **15.3 Responsibility For Safety And Health**

- 15.3.A. Contractor shall ensure that its and each tier of Subcontractors' employees, agents and invitees comply with applicable health and safety laws while at the Site. These laws include the Occupational Safety and Health Act of 1970 and rules and regulations issued pursuant thereto, and Library's safety regulations as amended from time to time. Contractor shall comply with anyc Library directions regarding protective clothing and gear.
- 15.3.B. Contractor shall be fully responsible for the safety of its and its Subcontractors' employees, agents and invitees on the Site. Contractor shall notify Library, in writing, of the existence of hazardous conditions, property or equipment at the Site that are not under Contractor's control. Contractor shall be responsible for taking all the necessary precautions against injury to persons or damage to the property of Contractor, Subcontractors or persons from recognized hazards until the responsible party corrects the hazard.
- 15.3.C. Contractor shall confine all persons acting on its or its Subcontractors' behalf to that portion of the Site where Work under the Contract Documents is to be performed, Library-designated routes for ingress and egress thereto, and any other Library-designated area. Except those routes for ingress and egress over which Contractor has no right of control, within such areas, Contractor shall provide safe means of access to all places at which persons may at any time have occasion to be present.

### **15.4 Emergencies**

- 15.4.A. In emergencies affecting the safety or protection of persons or Work or property at the Site or adjacent thereto, Contractor, without special instruction or authorization from Library, is obligated to act to prevent threat and damage, injury or loss, until directed otherwise by Library. Contractor shall give Library prompt written notice if Contractor believes that any significant changes in Work or variations from Contract Documents have been caused thereby. If Library determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order or Construction Change Directive will be issued to document the consequences of such action.

### **15.5 Use Of Roadways And Walkways**

- 15.5.A. Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic. Before beginning any interference and only with Library's prior concurrence, Contractor may provide detour, traffic control, or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of

these temporary facilities.

**15.6 Nondiscrimination**

15.6.A. No person or entity shall discriminate in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sexual preference, or gender of such persons, except as provided in Section 12940 of the Government Code. Every contractor for public works violating the provisions of Section 1735 of the Labor Code is subject to all the penalties imposed for a violation of Chapter 1, Part 7, Division 2 of the Labor Code.

**15.7 Prevailing Wages**

15.7.A. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (i) work of a similar character in the locality in which the Work is performed and (ii) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the California State Department of Industrial Relations to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site, in addition to all other job site notices prescribed by regulation. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at Library's Headquarters and are deemed included in the Bidding Documents. Upon request, Library will make copies available to any interested party. Contractor shall post the applicable prevailing wage rates at the Site.

15.7.B. Contractor shall forfeit, as a penalty to Library, Fifty Dollars (\$50.00) for each laborer, workman, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, workman or mechanic is paid less than the said stipulated rates for any Work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the California Labor Code. The sums and amounts which shall be forfeited pursuant to this paragraph 15.7.B and the terms of the Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 007200 and the Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by Library. The Labor Commissioner pursuant to Labor Code Section 1775 shall determine the final amount of forfeiture.

15.7.C. Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the Labor Code.

15.7.D. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation Labor Code Sections 1725.5, 1776 and 1810-1815. Failure to do so shall constitute a default under this Contract.

15.7.E. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776.

15.7.F. Contractor and Subcontractors must 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 Work of the Contract documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.

- 15.7.G. The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor as required by Labor Code Section 1776.
  - 15.7.G.1. Contractor shall inform Library of the location of records enumerated above, including the street address, city and county, and shall, within five working Days, provide a notice of a change of location and address.
  - 15.7.G.2. Contractor or Subcontractor has 10 Days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that Contractor or Subcontractor fails to comply with the 10-Day period, he or she shall, as a penalty to Library on whose behalf the contract is made or awarded, forfeit \$25.00 for each calendar Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this subparagraph due to the failure of a Subcontractor to comply with this subparagraph.
- 15.7.H. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor shall, and shall require all subcontractors to, furnish the records specified in Labor Code Section 1776 (e.g. electronic certified payroll records) directly to the Labor Commissioner in a format prescribed by the Labor Commissioner at least monthly.
- 15.7.I. Contractor and all Subcontractors shall be registered and qualified to perform public work pursuant to Labor Code Section 1725.5 as a condition to engage in the performance of any Work hereunder. Contractor shall verify that Subcontractors, including any Subcontractors that were not listed in the bid proposal, are registered pursuant to this paragraph 15.7.I.
- 15.7.J. If requested by Library, Contractor shall also deliver certified payrolls and any related labor compliance documentation to Library within 10 Days of Library's request.

## **15.8 Environmental Controls**

- 15.8.A. Contractor shall comply with all rules, regulations, ordinances, and statutes that apply to any Work performed under the Contract Documents including, without limitation, any toxic, water, and soil pollution controls and air pollution controls specified in Government Code Section 11017. Contractor shall be responsible for insuring that Contractor's Employees, Subcontractors, and the public are protected from exposure to airborne hazards or contaminated water, soil, or other toxic materials used during or generated by activities on the Site or associated with the Project.

## **15.9 Shoring Safety Plan**

- 15.9.A. At least 5 Days in advance of excavating any trench five feet or more in depth, Contractor shall submit to Library a detailed plan showing the shoring, bracing and sloping design and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.
- 15.9.B. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. Library's acceptance of any drawings showing the shoring or bracing design or work schedule

- shall not relieve Contractor of its responsibilities under this subparagraph.
- 15.9.C. Cal/OSHA Permit. Contractor shall comply with Labor Code 6500 and shall obtain, as applicable, a permit as required by Cal/OSHA for each of the following:
- 15.9.C.1. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.
  - 15.9.C.2. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).
  - 15.9.C.3. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).
  - 15.9.C.4. The underground use of diesel engines in mines or tunnels.

END OF DOCUMENT

**DOCUMENT 007300  
SUPPLEMENTARY CONDITIONS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. This document includes requirements that supplement the paragraphs of Document 007200 (General Conditions).

**1.2 SUPPLEMENTS**

**1.3 EXISTING UTILITIES**

- A. Drawings may indicate above-and below-grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities, and additional information may be on file at the regional notification center, the "Underground Service Alert" ("USA") center. Contractor shall locate these known existing installations before proceeding with trenching or other operations that may cause damage, shall maintain them in service where appropriate, and shall repair any damage to them caused by the Work, at no increase in Contract Sum. Additional utilities whose locations are unknown to Library are suspected to exist. Contractor shall be alert to their existence; if they are encountered, Contractor shall immediately report to Library for disposition of the same. In addition to reporting if any utility is damaged, Contractor shall take appropriate action as provided in this Document 007300. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Document 007300.
- B. At no additional cost to Library, Contractor shall incorporate into the Work main or trunk line utilities identified in the Contract Documents and other utilities or underground structures known or reasonably discernible and that will remain in service, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations. Should Library determine that Contractor has not responded in a timely manner or not diligently pursued restoration of service, Library may restore service and deduct the costs of such action by Library from the amounts due under the Contract.
- C. Consistent with Government Code Section 4215, as between Library and Contractor, Library will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or Document 003119 (Existing Condition Information). Library will compensate Contractor for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or Document 003119 (Existing Condition Information) with reasonable accuracy, and equipment on the Project necessarily idled during such Work.
- D. Prior to performing Work at the Site, Contractor shall lay out the locations of known underground utilities that are to remain in service and other significant known underground installations. At no additional cost to Library, prior to commencing other Work in proximity to such known underground utilities or installations that can be readily inferred from adjacent surface improvements, Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, such utilities or installations that are to remain and that are subject to damage. This obligation applies to all utilities (including, but not limited to, those referenced in paragraph 1.3.C of this Document 007300).
- E. Nothing in this Document 007300 shall be deemed to require Library to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred by Contractor from the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site. Contractor shall immediately secure all available information and notify Library and utility, in writing, of its discovery, while performing Work under the Contract Documents, of any utility facilities not identified in the Drawings and Specifications.

#### 1.4 UNDERGROUND FACILITIES

- A. Before commencing Work of digging trenches or excavation, Contractor shall review all information available regarding subsurface conditions, including but not limited to information supplied in Document 003119 (Existing Condition Information), and subject to the terms and conditions of these documents, Contractor shall also comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part:
- 1) "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two working days, but no more than 14 calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."
  - 2) Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching Work, Contractor shall provide Library with copies of all USA records secured by Contractor. Contractor shall advise Library of any conflict between information provided in Document 003119 (Existing Condition Information), the Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents.
  - 3) In addition, Library owns certain underground facilities which may not be reflected in USA records or those of other utility companies. Contractor shall notify Library's representative prior to commencing any excavation in locations not shown clearly and unambiguously in the Contract Documents and shall allow ample time for Library to locate and mark its facilities.
- B. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, but not limited to, Document 003119 (Existing Condition Information) and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, but not limited to, and by way of example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordinating the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.
- C. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by Library or in information on file at USA or is otherwise reasonably available to Contractor, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven Days), and prior to performing any Work in connection therewith (except in an emergency as required by Article 15.4.A of Document 007200), identify the Owner of such Underground Facility and give written notice to that Owner and to Library. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that is owned and was built by Library only where the Underground Facility:
- 1) Was not shown or indicated in the Contract Documents or in the information supplied pursuant to Document 003119 (Existing Condition Information) or in information on file at USA; and
  - 2) Contractor did not know of it; and
  - 3) Contractor could not reasonably have been expected to be aware of it or to have anticipated it from the information available. (For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, then an increase in the Contract Sum or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated in the Contract Documents, in the information supplied to Contractor pursuant to Document 003119 (Existing Condition Information), in information on file at USA, or otherwise reasonably available to Contractor.

- E. Contractor shall bear the risk that Underground Facilities may differ in nature or locations shown in information made available by Library pursuant to Document 003119 (Existing Condition Information), in information on file at USA, or otherwise reasonably available to Contractor. Underground Facilities are inherent in construction involving digging of trenches or other excavations and Contractor is to apply its skill and industry to verify the information available.

**1.5 WEATHER DELAYS**

- A. Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the parameters listed herein. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds the adverse weather contingency and Contractor proves that adverse weather actually caused delays. Contractor shall give written notice of intent to claim an adverse weather Day within one (1) Day of the adverse weather delay occurring. Rain parameters are listed below.
- B. The Adverse Weather Contingency for this contract will be 10 of Days work days, and Contractor shall include in the project schedule at least 2 of Days work days for adverse weather. The total number of rain days constitutes the Adverse Weather Contingency to be included in the project schedule as described in Document 013200 (Construction Progress Documentation). The Adverse Weather Contingency is included in the total Contract Time. In order to qualify as an adverse weather delay with respect to the foregoing parameters, daily rainfall must exceed 0.10 of an inch or more at the Santa Rosa, California station, as measured by the National Oceanic & Atmospheric Administration, and Contractor shall prove that the rain actually caused delay.
- C. Contractor shall include the foregoing rain parameters as a monthly activity in its Progress Schedule. As Work on the critical path is affected by rain, Contractor shall notify Library and request that the Days be moved to the affected activities. Any adverse weather Days remaining shall be considered Project Float.

**1.6 PRELIMINARY SCHEDULE OF SUBMITTALS**

- A. Seven (7) Days after Commencement Date, but no later than the Preconstruction Conference (whichever is earlier), a preliminary schedule of Submittals that shall list each required Submittal and the times for submitting, reviewing and processing such Submittal, as required by Document 013300 (Submittal Procedures). If no such schedule is agreed upon, then all Submittals shall be completed and submitted within 21 Days after receipt of Notice of Award from Library.

END OF DOCUMENT



## INSURANCE REQUIREMENTS

This document includes requirements that supplement, and are incorporated into, paragraph 4.1.A of Document 007200 (General Conditions).

### A. Contractor - Required Insurance

At or before the date specified in Document 002113 (Instructions to Bidders), Contractor shall furnish to Library satisfactory proof that Contractor has obtained the following insurance as specified below.

Library reserves the right to review any and all of the required insurance policies and/or endorsements, but has no obligation to do so. Failure to demand evidence of full compliance with the insurance requirements set forth in this Contract, or failure to identify any insurance deficiency, shall not relieve Contractor from, nor be construed or deemed a waiver of, its obligation to maintain the required insurance at all times during the performance of this Contract.

#### 1. Workers Compensation Insurance & Employers Liability Insurance

- a. Workers Compensation insurance with statutory limits as required by the Labor Code of the State of California.
- b. Employers Liability with minimum limits of \$1,000,000 per Accident; \$1,000,000 Disease per employee; \$1,000,000 Disease per policy.
- c. The policy shall be endorsed to include a written waiver of the insurer's right to subrogate against Library.
- d. Required Evidence of Insurance:
  - i. Subrogation waiver endorsement; and,
  - ii. Certificate of Insurance.

If injury occurs to any employee of Contractor, Subcontractor or sub-subcontractor for which the employee, or the employee's dependents in the event of employee's death, is entitled to compensation from Library under provisions of the Workers Compensation Insurance and Safety Act, as amended, or for which compensation is claimed from Library, Library may retain out of sums due Contractor under Contract Documents, amount sufficient to cover such compensation, as fixed by the Act, as amended, until such compensation is paid, or until it is determined that no compensation is due. If Library is compelled to pay compensation, Library may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse Library.

#### 2. General Liability Insurance

- a. Commercial General Liability Insurance on a standard occurrence form, no less broad than ISO form CG 00 01.
- b. Minimum Limits: The required limits may be provided by a combination of General Liability Insurance and Commercial Excess or Commercial Umbrella Liability Insurance. If Contractor maintains higher limits than the specified minimum limits, Library requires and shall be entitled to coverage for the higher limits maintained by Contractor.
  - i. Projects under \$1,000,000: \$1,000,000 per Occurrence; \$2,000,000 General Aggregate; \$2,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
  - ii. Projects from \$1,000,000 - \$4,999,999: \$2,000,000 per Occurrence; \$4,000,000 General Aggregate; \$4,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.

- iii. Projects from \$5,000,000 - \$9,999,999: \$5,000,000 per Occurrence; \$5,000,000 General Aggregate; \$5,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
  - iv. Projects \$10,000,000 and Over: Minimum Limits: \$10,000,000 per Occurrence; \$10,000,000 General Aggregate; \$10,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
- c. Any deductible or self-insured retention shall be shown on the Certificate of Insurance. If the deductible or self-insured retention exceeds \$25,000 it must be approved in advance by Library. Contractor is responsible for any deductible or self-insured retention and shall fund it upon Library's written request, regardless of whether Contractor has a claim against the insurance or is named as a party in any action involving the Library.
  - d. Insurance shall be maintained for the entire period of the Work including any warranty period. Completed operations insurance shall be maintained after the end of the warranty period for the additional periods specified below:
    - i. Projects under \$1,000,000: one (1) year after the end of the warranty period.
    - ii. Projects from \$1,000,000 - \$4,999,999: two (2) years after the end of the warranty period.
    - iii. Projects from \$5,000,000 - \$9,999,999: three (3) years after the end of the warranty period.
    - iv. Projects \$10,000,000 and Over: five (5) years after the end of the warranty period.
  - e. The Sonoma County Library, its Commission, and the Library's employees, representatives, consultants, and agents, shall be endorsed as additional insureds for liability arising out of ongoing and completed operations by or on behalf of the Contractor in the performance of the Contract Documents. Additional insured status shall continue for the periods specified in Section 2.d. above.
  - f. The additional insured endorsement for completed operations shall not be restricted to work performed during the current policy period.
  - g. The City of Petaluma shall be an additional insured for liability arising out of Contractor's ongoing operations (ISO endorsement CG 20 26, Additional Insured – Designated Person or Organization, or equivalent).
  - h. Noll & Tam Architects shall be additional insureds for liability arising out of Contractor's ongoing operations (ISO endorsement CG 20 32, Additional Insured – Engineers, Architects or Surveyors Not Engaged by the Named Insured, or equivalent).
  - i. The policy definition of "insured contract" shall include assumptions of liability arising out of both ongoing operations and the products-completed operations hazard (broad form contractual liability coverage including the "f" definition of insured contract in ISO form CG 00 01, or equivalent).
  - j. The insurance provided to the additional insureds shall be primary to, and non-contributory with, any insurance or self-insurance program maintained by them.
  - k. The policy shall not exclude injury or damage caused by, or resulting from, explosion, collapse and/or underground hazards.
  - l. The policy shall not contain a Contractors' Warranty or other similar language which eliminates or restricts insurance because of a subcontractor's failure to carry specific insurance or to supply evidence of such insurance.
  - m. The policy shall be endorsed to include a written waiver of the insurer's right to subrogate against all persons or entities that are, or are required to be, additional insureds.
  - n. The policy shall cover inter-insured suits between Contractor and the additional insureds and shall include a "separation of insureds" or "severability" clause which treats each insured separately.
  - o. Required Evidence of Insurance:
    - i. Additional insured endorsements or policy language granting additional insured status;
    - ii. Endorsement or policy language indicating that insurance is primary and non-contributory; and,
    - iii. Certificate of Insurance.

### 3. Automobile Liability Insurance

- a. Minimum Limits:
  - i. Projects under \$1,000,000: \$1,000,000 combined single limit per accident.
  - ii. Projects \$1,000,000 and Over: \$2,000,000 combined single limit per accident.
- b. The required limits may be provided by a combination of Automobile Liability Insurance and Commercial Excess or Umbrella Liability Insurance.
- c. Insurance shall cover all owned, hired and non-owned vehicles.
- d. The Sonoma County Library, its Commission, and the Library's employees, representatives, consultants, and agents shall qualify as insureds.
- e. Insurance shall be maintained for the entire term of this Contract, including any warranty period.
- f. Required Evidence of Insurance:
  - i. Endorsement or policy language indicating that Library, its Commission, and the Library's employees, representatives, consultants, and agents, are insureds; and,
  - ii. Certificate of Insurance.

### 4. Professional Liability/Errors & Omissions Insurance

*Required only if the Contractor or its employees engage in design or professional activities (architecture, engineering or surveying) which are not subcontracted out.*

- a. Minimum Limit: \$1,000,000 per claim or per occurrence.
- b. Any deductible or self-insured retention shall be shown on the Certificate of Insurance. If the deductible or self-insured retention exceeds \$25,000 it must be approved in advance by Library.
- c. If the insurance is on a Claims-Made basis, the retroactive date shall be no later than the commencement of the work.
- d. Insurance applicable to the work performed under the Contract shall be continued for two (2) years after completion of the work. Such continuation insurance may be provided by one of the following: (1) renewal of the existing policy; (2) an extended reporting period endorsement; or (3) replacement insurance with a retroactive date no later than the commencement of the work under this Contract.
- e. Required Evidence of Insurance: Certificate of Insurance.

### 5. Increase of Minimum Limits

Required minimum amounts of insurance may be increased should conditions of Work, in opinion of Library, warrant such increase. Contractor shall increase required insurance amounts upon direction by Library.

### 6. Standards for Insurance Companies

Insurers, other than the California State Compensation Insurance Fund, shall have an A.M. Best's rating of at least A:VII.

### 7. Documentation

- a. The Certificate of Insurance shall include the following reference: Petaluma Regional Library Renovation.
- b. Contractor agrees to maintain current Evidence of Insurance on file with Library for the periods specified above in Sections 1-5. Any requirement to maintain insurance after Final Completion of the Work, including providing Certificates evidencing required Insurance, shall survive the Contract.
- c. Required Evidence of Insurance shall be submitted to Dave Tichava at the following email address: Dtichava@sonomalibrary.org.
- d. Required Evidence of Insurance shall be submitted for any renewal or replacement of a policy

that already exists, at least ten (10) days before expiration or other termination of the existing policy.

- e. Contractor shall provide immediate written notice if: (1) any of the required insurance policies are terminated; (2) the limits of any of the required policies are reduced; or (3) the deductible or self-insured retention is increased.
- f. Upon written request, certified copies of required insurance policies must be provided within thirty (30) days.

## 8. Material Breach

If Contractor fails to maintain Insurance which is required pursuant to the Contract Documents, it shall be deemed a material breach. Library, at its sole option, may terminate the Contract for default and obtain damages from Contractor resulting from said breach. Alternatively, Library may purchase the required Insurance, and without further notice to Contractor, Library may deduct from sums due to Contractor any premium costs advanced by Library for such insurance. These remedies shall be in addition to any other remedies available to Library under the Contract Documents or Law.

## B. Subcontractors - Required Insurance

With respect to their portion of the work, Subcontractors of all tiers shall maintain the same insurance required to be maintained by Contractor with limits as follows:

1. Minimum General Liability Limits for Framing, Mechanical, and Electrical Subcontractors:
  - a. Projects under \$1,000,000: 1,000,000 per Occurrence; \$2,000,000 General Aggregate; \$2,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
  - b. Projects \$1,000,000 and Over: \$2,000,000 per Occurrence; \$4,000,000 General Aggregate; \$4,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
2. Minimum General Liability Limits for all Subcontractors other than Framing, Mechanical, and Electrical Subcontractors: \$1,000,000 per Occurrence; \$2,000,000 General Aggregate; \$2,000,000 Products/Completed Operations Aggregate. The General Aggregate shall apply separately to each Project.
3. Minimum Automobile Liability Limits: \$1,000,000 combined single limit per accident.
4. Minimum Employers Liability Limits: \$1,000,000 per Accident; \$1,000,000 Disease per employee; \$1,000,000 Disease per policy.
5. Professional Liability/Errors & Omissions Insurance (*Required for any architect, engineer, surveyor or other licensed professional engaged by Contractor to perform portions of the Work*)
  - a. Minimum Limit: \$1,000,000 per claim or per occurrence.
  - b. Any deductible or self-insured retention shall be shown on the Certificate of Insurance. If the deductible or self-insured retention exceeds \$25,000 it must be approved in advance by Library.
  - c. If the insurance is on a Claims-Made basis, the retroactive date shall be no later than the commencement of the work.
  - d. Coverage applicable to the work performed under the Contract shall be continued for two (2) years after completion of the work. Such continuation coverage may be provided by one of the following: (1) renewal of the existing policy; (2) an extended reporting period endorsement; or (3) replacement insurance with a retroactive date no later than the commencement of the work under this Contract.
  - e. Required Evidence of Insurance: Certificate of Insurance.

END OF DOCUMENT

**STATUTORY REQUIREMENTS - APPRENTICESHIP PROGRAM**

**1.1** Contractor and subcontractors shall comply with the requirements of California Labor Code Sections 1776, 1777.5, and 1777.6 concerning the employment of apprentices by Contractor or subcontractors. Willful failure to comply may result in penalties, including loss of the right to bid on or receive public works contracts.

**1.2** Section 1777.5, as amended, requires a contractor or subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one *hour* of apprentices work for every five *hours* of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

- A. When unemployment for the previous three-month period in the area exceeds an average of 15 percent;
- B. When the number of apprentices in training in the area exceeds a ratio of one to five;
- C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or
- D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

**1.3** Contractor is required to make contributions to funds established for administration of apprenticeship programs if contractor employs registered apprentices or journeypersons in  
Petaluma Regional Library Renovation **Statutory Requirements - Apprenticeship Program**

any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

- 1.4** Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of the California Department of Industrial Relations, or from the Division of Apprenticeship Standards and its branch offices.

END OF DOCUMENT

DOCUMENT 009113

**ADDENDA**

PETALUMA REGIONAL LIBRARY RENOVATION

(Addenda have been incorporated into the conformed Project Manual.)



END OF DOCUMENT

DOCUMENT 009114

**ADDENDUM SAMPLE**

**ADDENDUM NUMBER 1**

Issued: [Addendum Issue Date], 20

PETALUMA REGIONAL LIBRARY RENOVATION

FROM: Sonoma County Library  
6135 State Farm Drive  
Rohnert Park, CA 94928

TO: Prospective Bidders

This Addendum forms a part of and modifies the Project Manual dated [Project Manual Date], 20 . [Add option to list date of prior Addenda, if any] Bidder shall acknowledge receipt of this Addendum in the space provided in Document 004113 (Bid Form).

Double-underline designates text to be inserted; ~~strikethrough~~ designates text to be deleted.

Addendum Number 1 consists of 3 pages (size 8 ½" x 11") and [# Drawings] revised Drawings.

**1.1 GENERAL CHANGES**

- A. No changes.
- B.

**1.2 CHANGES TO PRIOR ADDENDA**

Petaluma Regional Library Renovation

**Addendum Sample**

A. No changes.

B.

**1.3 CHANGES TO INTRODUCTORY INFORMATION AND BIDDING REQUIREMENTS**

A. No changes.

B. Document [004113 (Bid Form)]

1) Paragraph \_\_\_\_\_, [add or change or delete] Bid Item \_\_\_\_\_.

a.

2) Bidder shall use the revised Document [004113 (Bid Form)] attached, marked "[REVISED \_\_/\_\_/\_\_]" in its Bid.

**1.4 CHANGES TO CONTRACTING REQUIREMENTS**

A. No changes.

B. Document [005213 (Agreement-Stipulated Sum)]

1) [New] Bid Item [\_\_\_\_\_] will be added to [or changed in] or [deleted from] the final Contract Documents.

**1.5 CHANGES TO CONDITIONS OF THE CONTRACT**

A. No changes.

B. Document [\_\_\_\_\_] (Title of Document)

1) Insert the following after Paragraph [\_\_\_\_]:

2) Delete Paragraph [\_\_\_\_], in its entirety.

3) Modify Paragraph [\_\_\_\_], as follows: [Copy a paragraph from the specs and use strikeouts and double underlines (or boxes)]

**1.6 CHANGES TO SPECIFICATIONS**

A. No changes.

B. Section [\_\_\_\_\_] (Title of Section)

1) Insert the following after Paragraph [\_\_\_\_]:

2) Delete Paragraph [\_\_\_\_], in its entirety.

3) Modify Paragraph [\_\_\_\_], as follows: [Copy a paragraph from the specs and use strikeouts and double underlines (or boxes)]

**1.7 CHANGES TO DRAWINGS**

Petaluma Regional Library Renovation

**Addendum Sample**

A. No changes.

**1.8 QUESTION(S)/ANSWER(S)**

A. No questions received as of issue date. Library's responses to Bidder questions shall be for the purposes of interpretation and clarification of the Contract Documents only, and shall not be construed as changing, superceding, or contradicting any express term in the Contract Documents. If any Bidder believes that a response to a question warrants a change in any term in the Contract Documents, the Bidder shall so request the change be made in writing addressed to Library and received no later than the latest date for submitting Bidder questions. In the absence of a change in any term of the Contract Documents, the express terms of the Contract Documents shall have precedence. Bidder questions are listed below verbatim.

B. [Bidder's Name]

1) [List question verbatim]

2) Library's response: samples: "This is in the Contract Documents" "Bid it as you see it" "The Agency finds this question ambiguous and cannot answer it"]

C. [Bidder's Name]

1) [List question verbatim]

2) Library's response: \_\_\_\_\_

D. [Bidder's Name]

1) [List question verbatim]

2) Library's response: \_\_\_\_\_

E. [Bidder's Name]

1) [List question verbatim]

2) Library's response: \_\_\_\_\_

END OF DOCUMENT

SECTION 011000

**SUMMARY**

**PART 1 GENERAL**

**1.1 SUMMARY**

A. Section includes:

- 1) Summary of Work and Work Restrictions including:
  - a. Work Covered By Contract Documents
  - b. Bid Alternates and Unit Prices
  - c. Work Under Other Contracts
  - d. Work Sequence
  - e. Hours Of Work And Notification Of Adjacent Residents
  - f. Partial Occupancy/Utilization Requirements
  - g. Products Ordered in Advance
  - h. Library-Furnished Products

**1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- A. Work comprises renovation and construction of Library's Petaluma Regional Library, located at 100 Fairgrounds Drive in Petaluma, California.
- B. Unless provided otherwise in the Contract Documents, all risk of loss to Work covered by Contract Documents shall rest with Contractor until Final Acceptance of the Work.

**1.3 WORK UNDER OTHER CONTRACTS**

- A. Contractor shall coordinate with Library and any Library forces, or other contractors and forces, as required by Document 007200 (General Conditions), paragraph 6.
- B. Library will contract with other contractors or forces for other work including but not limited to the following:
  - 1) City of Petaluma
  - 2) Facilities by Design
  - 3) Noll & Tam Architects

4) Consolidated Engineering Laboratories

**1.4 WORK SEQUENCE**

- A. Construct Work in stages and at times to accommodate Library operation requirements during the construction period; coordinate construction schedule and operations with Library.
  - 1) Work shall be completed in single phase
- B. The following portions of the work shall be substantially completed prior to Substantial Completion of all of the Work. Notify Library in writing when Contractor considers any such part of the Work ready for its intended use and Substantially Complete and request Library to issue a Certificate of Substantial Completion for that part of the Work.
  - 1) None

**1.5 HOURS OF WORK AND NOTIFICATION OF ADJACENT RESIDENTS**

- A. Prior to starting construction, the Library will notify adjacent residents, if any, of the proposed construction schedule.
- B. Outdoor construction activity, except for emergency situations, will be confined to the hours 7:00 a.m. through 7:00 p.m. on Monday through Friday and, with at least forty-eight (48) hours prior notification to and approval from Library's Project Manager, between 9:00 a.m. and 7:00 p.m. on Saturdays to minimize nuisances to local residents. Outdoor construction will not be allowed on Sundays or holidays.

**1.6 PARTIAL OCCUPANCY/UTILIZATION REQUIREMENTS**

- A. Contractor shall allow Library to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.
- B. Possession, use of Work, and placement and installation of equipment by Library shall not in any way evidence the completion of the Work or any part of it.
- C. Contractor shall not be held responsible for damage to the occupied part of the Work resulting from Library occupancy.
- D. Contractor shall make available, in areas occupied, on a 24-hour per day and 7-day per week basis if required, any utility services, heating, and cooling in condition to be put in operation at the time of occupancy.
  - 1) Responsibility for operation and maintenance of said equipment shall remain with Contractor.

- 2) Make, and Library shall certify, an itemized list of each piece of equipment so operated with the date operation commences.
  - 3) Itemized list noted above shall be basis for commencement of warranty period for equipment.
  - 4) Library shall pay for utility cost arising out of occupancy by Library during construction.
- E. Use and occupancy by Library prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by Library.
- F. Prior to date of Final Acceptance of the Work by Library, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to Defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Document 007200 (General Conditions).
- G. Use by Library of Work or part thereof as contemplated by this Section 011000 shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by Library of any of the conditions thereof.

## **PART 2 PRODUCTS**

### **2.1 PRODUCTS ORDERED IN ADVANCE**

- A. As provided in Section 012000 (Price and Payment Procedures), paragraph 1.5E, and subject to all other provisions of the Contract Documents, Library will pay for the following materials and equipment prior to incorporation into the Work:
- 1) [None]

### **2.2 LIBRARY-FURNISHED PRODUCTS**

- A. Library-Furnished Products: [None]

## **PART 3 EXECUTION – [NOT USED]**

END OF SECTION

## SECTION 012100

### ALTERNATES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes: Identification and description of each alternate.
- B. Related Documents:
  - 1) Bid Form: Price (additive or deductive from Contract Sum) of each Alternate.
  - 2) Agreement: Alternates accepted by County for incorporation into the Work.
  - 3) Sections of Specifications identified in each Alternate.

##### 1.2 PROCEDURES

- A. Alternates will be exercised at the option of Library at any time within 30 days of Contract award, or such later time (if any) indicated in Contract Documents. Any Alternate not so exercised will not be included in Work of Contract documents, nor shall Bid prices thereof be included in Contract Sum.
- B. Library exercise of any Alternate shall not adjust Contract Time, unless specifically stated otherwise in this Section 0122100.

#### PART 2 PRODUCTS- NOT USED

#### PART 3 EXECUTION

##### 3.1 SCHEDULE OF ALTERNATE BIDS

- A. ADD ALTERNATE NO. 1:
  - 1) Under Add Alternate 1, provide sand and refinish of existing T&G at exterior ceiling at entry canopy and exterior soffit at perimeter of the building, as indicated in plans.
- B. ADD ALTERNATE NO. 2:
  - 1) Under Add Alternate 2, provide exterior lighting at entry canopy as indicated in plans.
- C. ADD ALTERNATE NO. 3:
  - 1) Under Add Alternate 3, provide interior lighting at community room as indicated in plans.
- D. DEDUCT ALTERNATE NO. 1
  - 1) Under Deduct Alternate 1, deduct (4) skylights, and associated skylight well framing, ceiling finishes, roofing, lighting, fire sprinkler, structural and mechanical work and provide alternate reflected ceiling, lighting, structural, mechanical and fire protection as indicated in plans.
- E. DEDUCT ALTERNATE NO.2
  - 1) Under Deduct Alternate 2, deduct rooftop guardrails and fall protection lifeline systems and associated ceiling, roofing and structural work as indicated in plans.

END OF SECTION



## SECTION 012200

### UNIT PRICES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes: Unit Prices and procedures for doing unit price work. Payment for Unit Price Work shall be on the basis of actual quantities of additional or deleted Work satisfactorily performed in accordance with requirements of the contract documents.
- B. Related Documents: The completion of the work described in this Section may require work in or coordination with other sections of these specifications. Contractor and the subcontractor shall be responsible for identifying and including all related work in other Sections of these specifications and/or drawings necessary for a complete installation of the work described in his Section. These related Sections include but are not limited to the following:
  - 1) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 1 Specification Sections, apply to this Section
  - 2) Document 007200 – General Conditions: Article 14, Modifications of Contract Documents
  - 3) Section 012000 – Price and Payment Procedures
  - 4) Section 012600 – Contract Modification Procedures

##### 1.2 SCOPE OF WORK

- A. Unit Prices shall apply to Work covered by unit prices, regardless of quantity. By submitting a Bid, Contractor acknowledges that these unit prices shall remain fixed throughout performance of the Contract, regardless of any incremental cost differentials resulting from variances in any quantity estimates or increased or decreased economies of scale.

##### 1.3 DETERMINATION OF QUANTITIES

- A. Quantity of Work to be paid for under any item for which a unit price is fixed in Contract Documents shall be in number, as determined by Library, of units of Work satisfactorily completed in accordance with Contract Documents or as directed by Library. Unless otherwise provided, determination of number of units of Work so completed will be based, so far as practicable, on actual measurement or count within prescribed or

ordered limits, and no payment will be made for Work done outside of limits. Measurements and computations will be made by methods set forth in Contract Documents, including without limitation this Section 012000. If methods are not so set forth, measurements shall be made in any manner which Library considers appropriate for class of Work measured (e.g., pre-assigned values, percentage completion, units completed or incremental Milestones). Contractor must immediately inform Library of any disputes regarding quantity measurements and shall immediately supply Library with any documentation supporting the disputed measurements.

#### **1.4 PROCEDURE**

- A. Payment for Unit Price Work shall be on the basis of actual quantities of Work satisfactorily completed as set forth in the Specifications and shown on the Drawings.
- B. Refer to Section 012000 for payment application procedures.
- C. Measurement for payment of Unit Price items shall be as specified in Article 1.05 of Section 012000.
- D. Library reserves the right to increase or decrease the quantities shown on the Schedule of Bid Prices in Document 004113 or on the Drawings by the state maximum amount specified in Section 012000 without a change in the Unit Price.
- E. Refer to Section 012600 – Contract Modification Procedures for procedures for adjustment of Unit Prices for quantity increases, quantity decreases or deletions in the Work.

#### **1.5 SCHEDULE OF UNIT PRICES**

- A. Unit Price No. 1: \_\_\_\_\_
- B. Unit Price No. 2: \_\_\_\_\_
- C. Unit Price No. 3: \_\_\_\_\_

#### **1.6 BASIS OF PAYMENT**

- A. Unit Price Quantities: When estimated quantity for specific portions of Work is listed in Bid Form, quantity of Work to be paid for shall be actual number of units satisfactorily completed, as determined by Library and certified by Contractor, in accordance with Contract Documents.

END OF SECTION

## SECTION 012600

### CONTRACT MODIFICATION PROCEDURES

#### PART 1 GENERAL

##### 1.1 SUMMARY

A. Section includes:

- 1) Description of general procedural requirements for clarifications, alterations, modifications, and extras.

##### 1.2 GENERAL

- A. Any change in scope of Work or deviation from Contract Documents including, without limitation, extra Work, or alterations or additions to or deductions from the original Work, shall not invalidate the original Contract, and shall be performed under the terms of the Contract Documents.
- B. Only Contractor or Library may initiate changes in scope of Work or deviation from Contract Documents.
- 1) Contractor may initiate changes by submitting Requests for Information (RFIs).
    - a. RFIs shall be submitted to seek clarification of or to request changes in the Contract Documents.
    - b. RFIs related to concealed or unknown conditions shall be submitted in accordance with Document 007200 (General Conditions).
    - c. RFIs related to hazardous waste conditions shall be submitted in accordance with Document 007200 (General Conditions).
  - 2) Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration, regardless of the number of RFIs submitted. Contractor shall be responsible for both Library and its Architect's, Engineer's, and Consultant's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by Library; at Library's discretion, such costs may be deducted from progress payments or final payment.
  - 3) Library may seek to clarify Contract Documents provisions by issuing Architect's Supplemental Instruction (ASI). If Contractor disagrees with ASI or believes that complying with ASI entitles it to changes in the Work or Contract Time, Contractor shall notify Library in writing by submitting an RFI within ten (10) Days of receipt of the ASI.
  - 4) Library may initiate changes in the Work or Contract Time by issuing Requests for Proposals (RFPs) to Contractor. Such RFPs will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.
  - 5) Library may also, by Construction Change Directives (CCDs), order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly. A CCD shall be used in the absence of total agreement on the terms of a Change Order.

##### 1.3 PROCEDURES

- A. Cost Proposal and Procedures: Whenever Contractor is required in this Section 012600 to prepare a Cost Proposal, and whenever Contractor is entitled to submit a Cost Proposal and elects to do so, Contractor shall prepare and submit to Library for consideration a Cost Proposal using the form attached to this Section 012600. All Cost Proposals must contain a complete breakdown of costs of credits, deducts, and extras; itemizing materials, labor, taxes, overhead and profit; plus cost of bonds and insurance. The cost of bonds and insurance shall not be more than 2% of the total cost of materials, labor, taxes, overhead and profit. All Subcontractor Work shall be so indicated. Individual entries on the Cost Proposal form shall be determined as provided in paragraphs 1.4 and 1.5 of this Section 012600. After receipt of a Cost Proposal with a detailed breakdown, Library will act promptly thereon.

- 1) If Library accepts a Cost Proposal, Library will prepare Change Order for Library and Contractor signatures.
  - 2) If a Cost Proposal is not acceptable to Library, Library will submit in a response what it believes to be a reasonable cost and/or adjustment, if any. Except as otherwise provided herein, Contractor shall have 7 Days in which to respond to Library with a revised Cost Proposal.
  - 3) When necessity to proceed with a change which does not allow Library sufficient time to conduct a proper check of a Cost Proposal (or revised Cost Proposal), Library may issue a CCD ordering Contractor to proceed on a basis to be determined at earliest practical date. In this event, the value of change, with corresponding equitable adjustment to Contract, shall not be more than increase or less than decrease proposed.
- B. RFI Procedures: Whenever Contractor requires information regarding the Project or Contract Documents, or receives a request for information from a Subcontractor, Contractor may prepare and deliver an RFI to Library. Contractor shall use RFI format provided by Library. Contractor must submit time critical RFIs at least 30 Days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.
- 1) Library will respond within 10 Days from receipt of RFI with a written response to Contractor. Additionally, Library may return RFI to Contractor requesting additional information from Contractor should original RFI be inadequate in describing condition. Contractor shall distribute response to all appropriate Subcontractors.
  - 2) If Contractor is satisfied with the response and does not request change in Contract Sum or Contract Time, then the response shall be executed without a change.
  - 3) If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the number .1 indicating if it is a follow-up RFI) to Library clarifying original RFI.
  - 4) If Contractor believes that the response results in change in Contract Sum or Contract Time, Contractor shall notify Library in writing within seven (7) Days after receiving the response. If Library disagrees with Contractor, then Contractor shall proceed with the work identified and may give notice of intent to submit a Claim as described in Article 12 of Document 007200 (General Conditions), and submit its Claim within 30 Days of Library's response. If Library agrees with Contractor, then Contractor must submit a Cost Proposal within 21 Days of date of Library's response as described in article 1.3.A above. Contractor's failure to deliver either the foregoing notice and Claim or Cost Proposal by the respective deadlines stated in the foregoing sentences shall result in waiver of the right to file a Cost Proposal or Claim.
- C. Supplemental Instruction: Library may issue Supplemental Instruction to Contractor.
- 1) If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Time, then the Supplemental Instruction shall be executed without a Change Order.
  - 2) If Contractor believes that the response results in change in Contract Sum or Contract Time, Contractor shall follow the procedure described in paragraph 1.3.B.4.
- D. Construction Change Directives: If at any time Library believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, Library may issue a CCD with its recommended cost and/or time adjustment. Upon receipt of CCD, Contractor shall promptly proceed with the change of Work involved and concurrently respond to Library's CCD within 7 Days.
- 1) Contractor's response must be any one of following:
    - a. Provide written response to Library, accepting Library's response, time, and cost.
    - b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by the number .1, .2, .3, etc. for each revision), if Library so requests.
    - c. Give notice of intent to submit a Claim as described in Article 12 of Document 007200 (General Conditions).

- 2) If the CCD provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
    - a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
    - b. Unit prices stated in the Contract Documents or subsequently agreed upon.
    - c. Force Account.
    - d. Cost to be determined in a manner agreed.
    - e. Lump Sum.
  - 3) Contractor's written agreement to a CCD shall be recorded in a Change Order.
  - 4) If Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by Library on the basis of reasonable expenditures and savings of those performing the Work attributable to the change including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. If the parties still do not agree on the price for a CCD, Contractor may file a Claim per Article 12 of Document 007200 (General Conditions). Contractor shall keep and present, in such form as Library may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided in paragraphs 1.4 and 1.5 of this Document.
  - 5) Pending final determination of cost to Library, amounts not in dispute may be included in Applications for Payment after a Change Order is executed for the amount not in dispute.
- E. Library requested RFP: Contractor shall furnish a Cost Proposal within 21 Days of Library's RFP. Upon approval of RFP, Library will issue a Change Order directing Contractor to proceed with extra Work. If the parties do not agree on the price for an RFP, Library may either issue a CCD or decide the issue per Article 12 of Document 007200 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.
- F. All Changes:
- 1) Documentation of Change in Contract Sum and Contract Time:
    - a. Contractor shall maintain detailed records of Work performed on a time-and-material basis.
    - b. Contractor shall document each proposal for a change in cost or time with sufficient data to allow evaluation of the proposal.
    - c. Contractor shall, on request, provide additional data to support computations for:
      - 1) Quantities of products, materials, labor, and equipment
      - 2) Taxes, insurance, and bonds
      - 3) Overhead and profit
      - 4) Justification for any change in Contract Time and new Progress Schedule showing revision due, if any
      - 5) Credit for deletions from Contract, similarly documented
    - d. Contractor shall support each claim for additional costs, and for Work performed on a Force-Account basis, with additional information including:
      - 1) Credit for deletions from Contract, similarly documented
      - 2) Origin and date of claim
      - 3) Dates and times Work was performed and by whom
      - 4) Time records and wage rates paid
      - 5) Invoices and receipts for products, materials, equipment, and subcontracts, similarly documented
- G. Correlation of Other Items:
- 1) Contractor shall 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 as shown thereon prior to the next monthly pay period.
  - 2) Contractor shall revise the Progress Schedules prior to the next monthly pay period.
  - 3) Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.
- H. Responses: For all responses for which the Contract Documents, including without limitation this Section 012600, do not provide a specific time period, recipients shall

respond within a reasonable time.

#### **1.4 COST DETERMINATION**

- A. Total cost of extra Work or of Work omitted shall be the sum of labor costs, material costs, equipment rental costs, and specialist costs as defined herein plus overhead and profit as allowed herein. This limit applies in all cases of claims for extra Work, whether calculating Cost Proposals, Change Orders or CCDs, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature. No special, incidental or consequential damages may be claimed or recovered against Library, its representatives or agents, whether arising from breach of Contract, negligence, or strict liability, unless specifically authorized in the Contract Documents.
- B. Overhead and Profit: (Overhead shall be as defined in paragraph 1.8 of this Section 012600)
- 1) Overhead and profit on labor for extra Work shall not exceed fifteen percent (15%).
  - 2) Overhead and profit on materials for extra Work shall not exceed fifteen percent (15%).
  - 3) Overhead and profit on equipment rental for extra Work shall not exceed fifteen percent (15%).
  - 4) When extra Work is performed by a first tier Subcontractor, Contractor shall receive a five percent (5%) markup on Subcontractors' total costs of extra Work. First tier Subcontractor's markup on its Work shall not exceed fifteen percent (15%).
  - 5) When extra Work is performed by a lower tier Subcontractor, Contractor shall receive a total of five percent (5%) markup on all Subcontractors' total costs of extra Work. First tier Subcontractors and lower tier Subcontractors shall combine markup not to exceed nineteen percent (19%) and shall be divided as mutually agreed.
  - 6) Notwithstanding the foregoing, in no case shall the total markup on any extra Work exceed twenty five percent (25%) of the direct cost, notwithstanding the actual number of Contract tiers.
  - 7) On proposals covering both increases and decreases in Contract Sum, overhead and profit shall be allowed on the net increase only as determined in this paragraph 1.4. When the net difference is a deduction, no percentage for overhead profit and commission shall be allowed, but rather a deduction shall apply.
  - 8) The markup shall include profit, small tools, cleanup, engineering, supervision, warranties, cost of preparing the cost proposal, jobsite overhead, home office overhead, and other items as defined in paragraph 1.8 of this Section 012600. No markup will be allowed on taxes, insurance, and bonds.
- C. Taxes:
- 1) All State sales tax, use tax, and Sonoma Library and applicable City sales taxes shall be included.
  - 2) Federal and Excise tax shall not be included.
- D. Owner-Operated Equipment: When owner-operated equipment is used to perform extra Work, Contractor will be paid for operator as follows:
- 1) Payment for equipment will be made in accordance with paragraph 1.5C of this Document.
  - 2) Payment for cost of labor will be made at no more than rates of such labor established by Department of Industrial Relations Prevailing Wage Determination for type of worker and location of Work, whether or not owner-operator is actually covered by such an agreement.
- E. Accord and Satisfaction: Every Change Order shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay, and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order, but must do so expressly in writing delivered concurrently with the executed Change Order, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 007200 (General Conditions) no later than 30 Days of

Contractor's first written notice of its intent to reserve rights.

## 1.5 COST BREAKDOWN

- A. Labor: Contractor will be paid cost of labor for workers (including forepersons when authorized by Library) used in actual and direct performance of extra Work. Labor rate, whether employer is Contractor, Subcontractor or other forces, will be sum of following:
- 1) Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
  - 2) Labor surcharge: Payments imposed by local, Library, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined in paragraph 1.5.A.1 of this Section 012600, such as taxes and insurance. Labor surcharge shall be and shall not exceed that set forth in California Department of Transportation official labor surcharges schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein.
- B. Material: Only materials furnished by Contractor and necessarily used in performance of extra Work will be paid for. Cost of such materials will be cost, including sales/use taxes, to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:
- 1) If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to Library notwithstanding fact that such discount may not have been taken.
  - 2) For materials salvaged upon completion of extra Work, salvage value of materials shall be deducted from cost, less discounts, of materials.
  - 3) If cost of a material is, in opinion of Library, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in paragraph 1.5.B.1 of this Section 012600.
- C. Equipment Rental: For Contractor- or Subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the Association of Equipment Distributors (AED) book. For rented equipment, payment will be made based on actual rental invoices. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by Library. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.
- 1) For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by Library. The following shall be used in computing rental time of equipment:
    - a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be half (1/2) hour of operation.
    - b. When daily rates are listed, less than four hours of operation shall be considered to be half (1/2) Day of operation.
  - 2) For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
    - a. Library will pay for costs of loading and unloading equipment.

- b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
  - c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.
  - d. Library will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
- 3) Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which Library directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and except for legal holidays observed by the Library, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four (4) hours for zero (0) to four (4) hours of operation, six (6) hours for four (4) to six (6) hours of operation and eight (8) hours for six (6) to eight (8) hours of operation. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.

#### **1.6 FORCE-ACCOUNT WORK**

- A. If it is impracticable because of nature of Work, or for any other reason, to fix an increase or decrease in price definitely in advance, Contractor may be directed to proceed at a not-to-exceed (NTE) maximum price which shall not under any circumstances be exceeded. Subject to such limitation, such extra Work shall be paid for at actual necessary cost for Force-Account Work or at the negotiated cost, as determined by Library. The cost for Force-Account Work shall be determined pursuant to paragraphs 1.4 and 1.5 of this Section 012600.
- B. Force-Account Work shall be used when it is not possible or practical to price out the changed Work prior to the start of that Work. In these cases, Force-Account Work will be utilized during the pricing and negotiation phase of the change. Once negotiations have been concluded and a bilateral agreement has been reached, the tracking of the Work under Force-Account is no longer necessary. Force-Account Work shall also be used when a bilateral agreement on the value of the changed Work cannot be reached. Library may approve other uses of Force-Account Work.
- C. Whenever any Force-Account Work is in progress, Contractor shall report to Library each Business Day in writing in detail amount and cost of labor and material used, and any other expense incurred in Force-Account Work on preceding Day. No claim for compensation for Force-Account Work will be allowed unless report shall have been made. Force-Account (cost reimbursement) charges shall be recorded daily and summarized in a form acceptable to Library. Contractor or authorized representative shall complete and sign form each Day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; a list by size, type, and identification number of equipment and hours operated; and an indication of all Work performed by specialists.
- D. Whenever Force-Account Work is in progress, Contractor shall report to Library when seventy-five percent (75%) of the NTE amount has been expended.
- E. Force-Account Work shall be paid as extra Work under this Section 012600. Methods of determining payment for Work and materials provided in this paragraph 1.6 shall not apply to performance of Work or furnishings of material that, in judgment of Library, may properly be classified under items for which prices are otherwise established in Contract Documents.

#### **1.7 LIBRARY-FURNISHED MATERIALS**

- A. Library reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and overhead and profit on such materials.

#### **1.8 OVERHEAD DEFINED**

- A. The following constitutes charges that are deemed included in overhead for all Contract Modifications, including Force-Account Work or CCD Work, whether incurred by Contractor, Subcontractors, or suppliers, and Contractor shall not invoice or receive payment for these costs separately:
  - 1) Drawings: field drawings, Shop Drawings, etc., including submissions of drawings



- 2) Routine field inspection of Work proposed
- 3) General Superintendence
- 4) General administration and preparation of cost proposals, schedule analysis, Change Orders, and other supporting documentation as necessary
- 5) Computer services
- 6) Reproduction services
- 7) Salaries of project engineer, superintendent, timekeeper, storekeeper, and secretaries
- 8) Janitorial services
- 9) Temporary on-Site facilities, including for any extended periods of Contract Time
  - a. Offices
  - b. Telephones
  - c. Plumbing
  - d. Electrical: Power, lighting
  - e. Platforms
  - f. Fencing, etc.
  - g. Water
- 10) Home office expenses
- 11) Procurement and use of vehicles and fuel used coincidentally in Work otherwise included in the Contract Documents
- 12) Surveying
- 13) Estimating
- 14) Protection of Work
- 15) Handling and disposal fees
- 16) Final cleanup
- 17) Other incidental Work

**1.9 RECORDS AND CERTIFICATION**

- A. No payment for Force-Account Work shall be made until Contractor submits a Cost Proposal with original invoices substantiating materials and labor charges and all daily reports.
- B. Library shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for Modification of Contract, including Force-Account Work and CCD Work.
- C. Further, Library will have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, the Contract. If Contractor is a joint venture, right of Library shall apply collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to the Article 12 of Document 007200 (General Conditions).

END OF SECTION

COST PROPOSAL FORM FOLLOWS ON NEXT PAGE

# COST PROPOSAL

**Petaluma Regional Library Renovation  
Project No. 10-19**

Library Facilities Development and Management  
2300 Library Center Drive, Suite A220  
Santa Rosa, CA 95403  
(707) 565-2550 Phone  
(707) 565-3240 Fax

**CP Number:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**In Response To:** \_\_\_\_\_  
RFP#, RFI# or ASI#

**FROM:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TO:** [Project Manager]  
[Address]

This Cost Proposal is in response to the above referenced form.

Brief description of change(s):

Number of pages attached: \_\_\_\_\_

ITEM DESCRIPTION	PRIME CONTR	SUB 1 (NAME)	SUB 2 (NAME)	SUB 3 (NAME)	SUB 4 (NAME)	TOTAL
Material						
Direct Labor Cost						
Equipment						
Other (Specify) Extended Overhead						
Total Cost						
Subcontractor's Overhead and Profit 15% - 19% max						
Contractor's Overhead and Profit 15%						
Subcontractor Total						
O/P to Contractor For Sub-contractor's work at 5%						
Bonds and Insurance 2%						
<b>GRAND TOTAL</b>						

<b>REQUESTED CHANGE IN CONTRACT TIME</b>	<b>DAYS</b>	
--	-------------	--

BY

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
Architect

- Architect agrees with above proposal.
- Architect DOES NOT agree with above proposal. See attached.

Date \_\_\_\_\_

Date \_\_\_\_\_

SECTION 013150

**PROJECT MEETINGS**

**PART 1 GENERAL**

**1.1 SUMMARY**

A. Section Includes:

- 1) Descriptions of the required Project meetings for the Work. These meetings include:
  - a. PRECONSTRUCTION CONFERENCE
  - b. PERIODIC PROGRESS MEETINGS
  - c. SPECIAL MEETINGS

**1.2 PRECONSTRUCTION CONFERENCE**

- A. Library will call for and administer a Preconstruction Conference at a time and place to be announced (usually the week prior to start of Work at the Site).
- B. Contractor, its job superintendent, all major Subcontractors, and major suppliers shall attend Preconstruction Conference.
- C. Agenda may include, but not be limited to, the following items.
  - 1) Schedules
  - 2) Personnel and vehicle permit procedures
  - 3) Use of premises
  - 4) Location of Contractor's on-Site facilities
  - 5) Security
  - 6) Housekeeping
  - 7) Submittal and RFI procedures
  - 8) Inspection and testing procedures, on-Site and off-Site
  - 9) Utility shutdown procedures
  - 10) Control and reference point survey procedures
  - 11) Contractor's Injury and Illness Prevention Program
  - 12) Contractor's Initial Schedule

- 13) Contractor's Schedule of Values
  - 14) Contractor's Schedule of Submittals
  - 15) Jurisdictional agency requirements
- D. Library will distribute copies of meeting notes to attendees. Attendees shall have seven (7) Days to submit comments or additions to meeting notes. Meeting notes will constitute final memorialization of results of Preconstruction Conference.

### **1.3 PERIODIC PROGRESS MEETINGS**

- A. Library will schedule and administer periodic progress meetings throughout duration of Work. Progress meetings will be held periodically unless otherwise directed by Library.
- 1) Meetings shall be held at Contractor's on site field office unless otherwise directed by Library.
  - 2) A Library Representative will prepare agenda.
  - 3) Library will record and distribute meeting notes to Contractor, who will distribute to those affected by decisions made at meeting. Attendees can either submit comments or additions to meeting notes prior to the next progress meeting, or may attend the next progress meeting and submit comments or additions there. Meeting notes, with any comments or additions, will constitute final memorialization of results of meeting.
- B. Progress meetings shall be attended by Contractor's job superintendent, major Subcontractors and suppliers as determined by Contractor, Library, and others as appropriate to agenda topics for each meeting.
- C. Agenda may contain the following items, as appropriate:
- 1) Review, revise as necessary, and approve previous meeting notes.
  - 2) Safety and Security: Review of Work progress since last meeting. Review of Contractor's safety program activities and results, including report on all serious injury and/or damage accidents.
  - 3) Old Business: Discuss Open Items in previous meeting notes
  - 4) New Business: Discuss new items
  - 5) Review Progress Schedule/Look Ahead: Status of Construction Work Schedule, delivery schedules, adjustments. Submittal, RFI, and Change Order status.
  - 6) Other items affecting progress of Work.

### **1.4 SPECIAL MEETINGS**

- A. Library or Contractor may call special meetings by notifying all desired participants and Library in advance, giving reason for meeting. Special meetings may be held without advance notice in emergency situations.
- B. At any time during the progress of Work, Library shall have authority to require Contractor attend meeting of any or all of the Subcontractors engaged in Work or in other work, and notice of such meeting shall be duly observed and complied with by Contractor.

END OF SECTION

## SECTION 013200

### CONSTRUCTION PROGRESS DOCUMENTATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Perform scheduling of Work under this Contract in accordance with requirements of this Section 013200.
  - 1) Development of schedule, of the Progress Schedule, monthly payment requests, and Project status reporting requirements of the Contract Documents shall employ scheduling as required in this Section 013200.
  - 2) Submit schedules and reports as specified in 007200 (General Conditions).
- B. Upon Award of Contract, immediately commence development of Initial Schedule to ensure compliance with schedule submittal requirements.

##### 1.2 GENERAL

- A. Progress Schedule shall be based on and incorporate Milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each Milestone shown on Progress Schedule shall adhere to times in Document 005213 (Agreement Form - Stipulated Sum), unless an earlier (advanced) time of completion is requested by Contractor and agreed to by Library. A Change Order shall formalize any such agreement.
  - 1) Library is not required to accept an earlier (advanced) schedule, i.e., one that shows early completion date(s) for the Contract Time.
  - 2) Contractor is not entitled to extra compensation in event agreement is reached on an earlier (advanced) schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in earlier (advanced) schedule but within the Contract Time.
- C. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- D. Failure of Progress Schedule to include any element of the Work or any inaccuracy in Progress Schedule will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. Library's acceptance of Schedule shall be for its

use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon Library, or act to relieve Contractor of its responsibility for means and methods of construction.

- E. Transmit each item under form approved by Library or following Section 013300.
  - 1) Identify Project with Library Contract number, and name of Contractor.
  - 2) Provide space for Contractor's approval stamp and Library's review stamps.
  - 3) Submittals received from sources other than Contractor will be returned to Contractor without Library's review.
  
- F. Include adverse weather contingency described in Document 007200 (General Conditions) and in Document 007300 (Supplementary Conditions) as the last activity in the Progress Schedule. If adverse weather Day(s) are granted by Library, deduct the number of Day(s) from the weather contingency and apply those Day(s) to the date(s) the weather delay occurred.
  - 1) Adverse weather contingency shall be work days, not calendar days.
  - 2) Any unused adverse weather contingency days shall remain part of the total Contract Time.
  - 3) If weather related Day(s) are granted, such as wet soil conditions caused by rainfall, the time granted will be a contract time extension, not a reduction to the adverse weather contingency.

### **1.3 INITIAL AND ORIGINAL PROGRESS SCHEDULE**

- A. Contractor shall prepare an Initial Schedule for review at the Preconstruction Conference which shall serve as Contractor's schedule for up to fifteen (15) Days after the Notice to Proceed.
- B. Initial Schedule must indicate detailed plan for the Work to be completed in first sixty (60) Days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; and procurement of materials and equipment. Show Work beyond sixty (60) Days in summary form.
- C. Contractor shall submit its Original Schedule for review no later than first progress payment. Original Schedule and all updates shall comply with all standards herein.
- D. All Schedules shall be time-scaled.
- E. Library's review and comment on any Schedule shall be limited to Contract conformance (with sequencing, coordination, and Milestone requirements). Contractor shall make corrections to Schedule necessary to comply with Contract requirements and shall

adjust Schedule to incorporate any missing information requested by Library. Resubmit Initial Schedule if requested by Library.

#### **1.4 SCHEDULE FORMAT AND LEVEL OF DETAIL**

- A. Each Schedule (Initial, Original, and updates) shall indicate all separate fabrication, procurement and field construction activities required for completion of the Work, including but not limited to the following:
- 1) All Contractor, Subcontractor, and assigned Contractor Work shall be shown in a logical Work sequence that demonstrates a coordinated plan of Work for all contractors. The intent is to provide a common basis of acceptance, understanding, and communication, as well as interface with other contractors.
  - 2) Activities related to the delivery of Contractor- and Library-furnished equipment to be Contractor-installed per Contract shall be shown.
  - 3) Apply the following information to all activities:
    - a. All activities shall be identified through codes or other identification to indicate the building (i.e. buildings, Site Work).
    - b. Include Contractor/Subcontractor responsibility to which they pertain to each activity.
    - c. Time scaled, CPM schedule.
    - d. No activity on schedule shall have duration longer than fifteen (15) workdays, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by Library.
      - 1) Activity durations shall be total number of actual workdays required to perform that activity.
    - e. Start and completion dates of all items of Work, their major components, and milestone completion dates, if any. Show critical path in red; show early start, late start, and total float for each activity.
    - f. Library-furnished materials and equipment, if any, identified as separate activities.
    - g. All facility equipment commissioning activities.
    - h. Activities for maintaining Project Record Documents.
    - i. Dependencies (or relationships) between activities.
    - j. Processing/approval of submittals and shop drawings for all Contract Documents-required material and equipment. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier



than expected acceptance or delivery dates. See Section 013300 (Submittal Procedures).

- 1) Include time for submittals, resubmittals, and reviews by Library. Coordinate with accepted schedule for submission of shop drawings, samples and other submittals.
  - 2) Contractor shall be responsible for all impacts resulting from resubmittal of shop drawings and submittals.
- k. Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
- 1) Include time for fabrication and delivery of manufactured products for Work.
  - 2) Show dependencies between procurement and construction.
- l. Activity description; what Work is to be accomplished and where.
- m. Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing Work.
- n. Identify activities that constitute the controlling operations or critical path. No more than twenty-five percent (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to ten (10) days.
- o. Interface with the work of other contractors, Library, and agencies such as, but not limited to, utility companies.
- p. Show detailed Subcontractor Work activities.
- q. Activity durations shall be in Work days.
- r. Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- B. Seasonal weather conditions (which do not constitute a delay as defined herein) shall be considered in the planning and scheduling of all Work influenced by high or low ambient temperatures or presence of high moisture for the completion of the Work within the allotted Contract Time.
- C. Failure by Contractor to include any element of Work required for performance of the Work on the detailed construction schedule shall not excuse Contractor from completing all Work required within the Contract Time.
- D. Progress Schedule Submittals

- 1) Submit one (1) electronic and two (2) print copies of schedule at each of the following times:
  - a. Initial Progress Schedule at the Preconstruction Conference
  - b. Original Schedule within twenty (20) Days of the Notice to Proceed date
  - c. Adjustments to the Schedule as required
  - d. Schedule updates monthly, five (5) Days prior to monthly progress schedule and billing meeting
- 2) Contractor shall submit additional schedule reports as may be requested by Library.
- 3) Electronic files shall be complete copies, including all programs and electronic coding.

#### **1.5 MONTHLY SCHEDULE UPDATE SUBMITTALS**

- A. Following acceptance of Contractor's Initial Schedule, Contractor shall monitor progress of Work and adjust Schedule each month to reflect actual progress and any anticipated changes to planned activities. Schedule update submittals shall be submitted with each Contractor application for payment.
  - 1) Each Schedule update submitted shall be complete, including all information requested for the Initial Schedule and Original Schedule submittal.
  - 2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed, and Contractor warrants the accuracy of as-built information as shown.
- B. Schedule update submittals are due with each monthly progress payment application.

#### **1.6 SCHEDULE REVISIONS**

- A. With each Schedule update identify clearly any revisions affecting the sequence of Work, provide a schedule diagram that compares the original sequence to the revised sequence of Work. Clearly show and discuss any changes in the critical path.
- B. Schedule revisions shall not be incorporated into any schedule update until Library has reviewed the revisions. Library may request further information and justification for schedule revisions and, within three (3) Days, Contractor shall provide Library with a complete written narrative response to Library's request.
- C. If Library does not accept Contractor's revision, and Contractor disagrees with Library's position, Contractor has seven (7) Days from receipt of Library's letter rejecting the revision, to provide a written narrative providing full justification and explanation for the revision. Contractor's failure to respond in writing within seven (7) Days of Library's written rejection of a schedule revision shall be contractually interpreted as acceptance

of Library's position, and Contractor waives its rights to subsequently dispute or file a claim regarding Library's position. If Contractor files a timely response as provided in this paragraph, and the parties are still unable to agree, Contractor's sole right shall be to file a claim as provided in Document 007200 (General Conditions), Article 12.

- D. At Library's discretion, Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

## **1.7 RECOVERY SCHEDULE**

- A. If a Schedule update shows a Substantial Completion date beyond any Contract Substantial Completion date, or individual Milestone completion dates, Library may require Contractor to submit to Library within seven (7) Days proposed revisions to recover the lost time. As part of this submittal, provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, provide a schedule diagram comparing the original sequence to the revised sequence of Work. If Library reasonably requests, show the intended critical path; secure appropriate Subcontractor and supplier consent to the recovery Schedule; submit a narrative explaining trade flow and construction flow changes, duration changes, added/deleted activities, critical path changes and identify all near critical paths and man-hour loading assumptions for major Subcontractors. Contractor agrees to take all necessary actions to recover time at no additional cost to Library. These actions may include, but are not limited to:
  - 1) Increase manpower in quantities and crafts necessary;
  - 2) To the extent allowed by applicable legal requirements, increase the number of working hours per shift, shifts per working day, working days per week, the amount of equipment, or and combination of the foregoing.
- B. The revisions shall not be incorporated into any Schedule update until Library has reviewed the revisions.
- C. If Library does not accept Contractor's revisions, Library and Contractor shall follow the procedures in paragraphs 1.6B, 1.6C, and 1.6D of this Section 013200.
- D. At Library's discretion, Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

## **1.8 TIME EXTENSIONS**

- A. Contractor is responsible for requesting time extensions for time impacts that, in the opinion of Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accordance with Document 007200 (General Conditions).
- B. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.

- C. No time will be granted under the Contract Documents for cumulative effect of changes.
- D. Library will not be obligated to consider any time extension request unless requirements of Contract Documents are complied with.
- E. Failure of Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.

**1.9 WEEKLY SCHEDULE REPORT**

- A. At the Weekly Progress Meeting, described in Section 013150 (Project Meetings), Contractor shall provide and present a time scaled three week look ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

END OF SECTION

## SECTION 013300

### SUBMITTAL PROCEDURES

#### PART 1 GENERAL

##### 1.1 SUMMARY

A. Section Includes:

- 1) Description of general requirements for Submittals for the Work:
  - a. Procedures
  - b. Product Data
  - c. Shop Drawings
  - d. Samples
    - 1) Design Data
    - 2) Test Reports
    - 3) Certificates
    - 4) Manufacturers' Instructions
    - 5) Material Safety Data Sheets
  - e. Installation, Operation, and Maintenance Manual
  - f. Computer Programs
  - g. Project Record Documents
- 2) PROJECT Delay CAUSED BY Submittal

##### 1.2 PROCEDURES

- A. Submit at Contractor's expense the following items ("Submittals") required by the Contract Documents:
- 1) Schedule of Submittals
  - 2) Safety Program
  - 3) Progress Schedule
  - 4) Product Data; Shop Drawings; Samples

- 5) Storm Water Pollution Prevention Plan
  - 6) Coordination Drawings
  - 7) Quality Assurance/Control Data
  - 8) Machine Inventory Sheets
  - 9) Installation, Operation, and Maintenance Manual
  - 10) Computer Programs
  - 11) Project Record Documents
  - 12) Other material requested by Library
- B. Submit these Submittals to Library, in accordance with in accordance with the accepted initial and/or Progress Schedule and with such promptness as to cause no delay in Contractor's own work or that of any other Library contractor.
- C. Transmit each item with Library provided Submittal transmittal form. Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data that are applicable to this Project. Inapplicable portions shall be marked out. Organize Submittals by Specification Section. Submittals containing information about more than one Specification Section will be returned for resubmittal. Submittals shall include all information requested by each Specification Section. Incomplete Submittals will be returned not reviewed by Library.
- D. Begin no fabrication or Work that requires Submittals until Library's review does not require resubmittal. Do not extrapolate from Submittals covering similar Work.
- E. The data shown on the Submittals shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Library the materials and equipment Contractor proposes to provide and to enable Library to review the information for the limited purposes specified in this Section 013300. Submittals shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as Library may require to enable Library to review the Submittal.
- F. At the time of each submission, Contractor shall give Library specific written notice of all deviations, if any, that the Submittal may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication attached to the Submittal transmittal form. In addition, Contractor shall cause a specific notation to be made on each Submittal submitted to Library for review and approval of each such variation. Library reserves the right to reject any product or work provided by Contractor if Contractor fails to provide this written notice of all deviation, even if Library and/or Architect approved the Submittal.
- G. Submittal coordination and verification is the responsibility of Contractor; this responsibility shall not be delegated in whole or in part to Subcontractors or suppliers.

Before submitting each Submittal, review and coordinate each Submittal with other Submittals and with the requirements of the Work and the Contract Documents, and determine and verify:

- 1) All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - 2) All materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - 3) All information relative to Contractor's sole responsibility for means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.
- H. Contractor's submission to Library of a Submittal shall constitute Contractor's representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above in this paragraph 1.2 of this Section 013300, with respect to Contractor's review and approval of that Submittal.
- I. Designation of Work "by others" or the like in a Submittal shall not limit Contractor's responsibility under Contract Documents for either the Submittal or any work described therein.
- J. After review by Library of each Submittal, material will be returned to Contractor with actions defined as follows:
- 1) NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with future Submittals and additional partial Submittals for portions of the Work not covered in this Submittal. Does not constitute approval or deletion of specified or required items not shown on the Submittal.
  - 2) MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as item 1 above, except that minor corrections as noted shall be made by Contractor.
  - 3) REVISE AS NOTED AND RESUBMIT - Rejected because of major inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by Library.
  - 4) INCOMPLETE SUBMITTAL - RESUBMIT - A portion of the submitted material does not conform to Drawings and/or Specifications (i.e. information is missing or incorrect). Contractor shall correct prior to subsequent review by Library.
  - 5) REJECTED - RESUBMIT - Submitted material does not conform to Drawings and/or Specifications in major respect, i.e.: wrong size, model, capacity, or material.
  - 6) RETAINED FOR A/E AND LIBRARY RECORD ONLY - INFORMATIONAL ONLY - No further action is required by Contractor.

- K. Library reserves the right to deduct monies from payments due Contractor to cover additional costs of review beyond the second submission. Illegible Submittals will be rejected and returned to Contractor for resubmission. Contractor shall be in breach of the Contract if Contractor, at least by second submission, is not complete.
- 1) Charge for resubmissions:
- a. One re-examination of Contractor's Submittals that have been returned for correction or replacement will be included in Library's budget. Any additional re-examination of Contractor's Submittals will be considered additional scope services to be paid by Contractor through Library. Contractor shall pay Library (or Library may deduct from any progress or final payment), for Library personnel time on an hourly basis at 2.5 times direct payroll expenses, and for consultant (including A/E) personnel time at 1.25 times the amount billed Library.
- L. Favorable review will not constitute acceptance by Library of any responsibility for the accuracy, coordination, or completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back-check comments, corrections, and modifications from Library's review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals, but Contractor shall ascertain that Submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Library's review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of Submittal, method of Work, or information regarding materials and equipment Contractor proposes to provide shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Library, or any officer or employee thereof, and Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of Work or material and equipment so accepted. Favorable review shall be considered to mean merely that Library has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials and equipment proposed.
- M. Unless otherwise specified, Library's review will not extend to the means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- N. Submit complete initial Submittal for those items where required by individual Specification Sections. Complete Submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in Specification Sections, shall include motor data and seismic



anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named.

- O. Copy, conform, and distribute reviewed Submittals in sufficient numbers for Contractor’s files, Subcontractors, and vendors. Distribute copies of reviewed Submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions
- P. After Library’s review of Submittal, revise as noted and resubmit as required. Identify changes made since previous Submittal.
  - 1) Normally, Submittals will be processed and returned to Contractor within twenty-eight (28) Days of receipt.
- Q. All Submittals shall be number-identified by Contractor, using unique sequential numbers for each submittal.
- R. Submission Requirements:
  - 1) Schedule submission of submittals so as not to delay Work and allow twenty-eight (28) Days from Library receipt of initial Submittal and an additional twenty-eight (28) Day review period for all subsequent Submittals without delay to Work. Deliver initial Submittals to Library at least twenty-eight (28) Days before dates reviewed Submittals will be needed.
  - 2) Unless otherwise noted, the following table lists the number of initial Submittals required from Contractor for each type of submission, to whom Contractor shall distribute the information, and Library’s return of reviewed submissions. If Contractor needs more copies of reviewed Submittals returned to it, then either submit additional copies or make copies from the returned Submittal. Submittals requiring resubmission will require the same quantity and distribution as an initial Submittal.

Provide two (2) additional copies of each submittal for products and/or systems included in Section 019100 (Commissioning) for review by the Commissioning Agent if Commissioning is part of the Work.

SUBMITTAL	Contractor Submittal		A/E Submittal Review Return	
	# of Copies/ Prints/ Samples*		# of Copies/ Prints/ Samples*	
Items Go To →	Library	A/E	Library	Contractor
Shop Drawings	2	4	2	1
Product Data	2	4	2	1

Samples	1	3	1	1
MSDSs	1	1	0	0
Installation, Operation, and Maintenance Manual	1	3	2	0
Other Documents	2	4	2	1

\*If submittal is an electronic file, only one (1) copy of the file should be submitted.

- 3) Accompany Submittals with Submittal transmittal form provided by Library, containing:
  - a. Date, revision date, and Submittal identification number
  - b. Project name and Library's Contract number
  - c. Contractor's name, address, and job number
  - d. Specification Section number clearly identified
  - e. The quantity of Shop Drawings, Product Data, or Samples submitted
  - f. Notification of deviations from Contract Documents
- 4) Submittal shall include:
  - a. Date and revision dates
  - b. Revisions, if any, identified
  - c. Project Name and Contract number
  - d. The names of:
    - 1) Contractor, Subcontractor, Supplier, Manufacturer, and separate detailer, when pertinent
  - e. Identification of product material by location within the Project
  - f. Relation to adjacent structure or materials
  - g. Field dimensions, clearly identified as such
  - h. Specification Section number and applicable detail reference number and Drawing number
  - i. Applicable reference standards, such as ASTM, ANSI, FS, NEMA, SMACNA or ACI
  - j. A blank space, on each Drawing or data sheet, 5" x 4" for the A/E review stamp
  - k. Identification of deviations from Contract Documents

- l. Contractor's stamp, initialed or signed, with language certifying the review of Submittals, verification of field measurements, construction criteria, and technical standards in compliance with Contract Documents
  - m. MSDS for each item complying with OSHA's Hazard Communication Standard 29 CFR 1910.1200
  - n. Other pertinent data
- S. Resubmission requirements:
- 1) Shop Drawings:
    - a. Revise initial Shop Drawings as required and resubmit as specified for initial Submittals.

Resubmittals require the same amount of time to review as an initial submittal.

    - b. Indicate on Shop Drawings any changes that have been made other than those requested by Library.
  - 2) Product Data and Samples:
    - a. Submit new Product Data and Samples as required for initial Submittals.
  - 3) Installation, Operation, and Maintenance Manual:
    - a. Revise initial Installation, Operation, and Maintenance Manual(s) as required and resubmit as specified for initial Submittals.

### **1.3 PRODUCT DATA**

- A. Within ten (10) Days after the Notice to Proceed Commencement Date, submit two (2) copies of complete list of major products proposed for use, with name of manufacturer, telephone number, trade name, and model number of each product. Tabulate data by Specification Section.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Product or Catalog Data:
  - 1) Manufacturers' standard drawings shall be modified to delete non-applicable data or include applicable data.
  - 2) Manufacturers' catalog sheets, brochures, diagrams, schedules, charts, illustrations, and other standard descriptive data:
    - a. Mark each copy to identify pertinent materials, products, or models.
    - b. Show dimensions and clearances required, performance characteristics and capacities, wiring diagrams and controls.

- 3) Material Safety Data Sheets:
  - a. In addition to MSDSs otherwise required by the Contract Documents, submit four (4) copy for any products containing a hazardous substance such as paints, solvents, thinners, varnish, lacquer, glues and adhesives, mastics, sealants, equipment fuel, equipment lubricant, or other materials needed for the Project as required by the individual Specification Sections or as otherwise specified in the Contract Documents.
  - b. MSDSs must be submitted with Product Data in order for the Submittal to be reviewed.
- D. Supplemental Data:
  - 1) Submit number of copies that Contractor requires, plus two (2) copies that will be retained by Library.
  - 2) Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to Project.
- E. Provide copies for Project Record Documents described in Section 017839 (Project Record Documents).

#### **1.4 SHOP DRAWINGS**

- A. Minimum Sheet Size: 8½ inches by 11 inches. All others: Multiples of 8½ inches by 11 inches, 34 inches by 44 inches maximum.
- B. Original sheet or reproducible transparency will be marked with Library's review comments and returned to Contractor.
- C. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.
- D. Include manufacturers' installation instructions when required by Specification Section.
- E. If Contractor submits Shop Drawings for items that Shop Drawings are not specified, Library will not be obliged to review them.
- F. Contractor is responsible for procuring copies of Shop Drawings for its own use as it may require for the progress of the Work.
- G. Shop Drawings shall be drawn to scale and completely dimensioned, showing plan view together with such sectional views as are necessary to clearly show construction detail, materials, and methods.

#### **1.5 SAMPLES**

- A. Submit full range of manufacturers' standard colors, textures, and patterns for Library's selection.

- B. Submit Samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Coordinate Submittal of different categories for interfacing Work.
- C. Include identification on each Sample, giving full information.
- D. Sizes: Unless otherwise specified, provide the following:
  - 1) Paint Chips: Manufacturers' standard
  - 2) Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
  - 3) Linear Products: Minimum 6 inches, maximum 12 inches long
  - 4) Bulk Products: Minimum 1 pint, maximum 1 gallon
- E. Full size Samples may be used in Work upon approval by Library.
- F. Field Samples and Mock-ups (if applicable):
  - 1) Erect field Samples and mock-ups at Site in accordance with requirements of Specification Sections. If testing is conducted, record and certify results and full Contract compliance.
  - 2) Modify or make additional field Samples and mock-ups as required to provide appearance and finishes approved by Library.
  - 3) Approved field Samples and mock-ups may be used in Work upon approval by Library.
  - 4) Construct or prepare as many additional Samples as may be required, as directed by Library, until desired textures, finishes, and/or colors are obtained.
  - 5) Accepted Samples and mock-up shall serve as the standard of quality for the various units of Work.
- G. No review of a Sample shall constitute a change or modify the requirements in the Contract Documents.
- H. Finishes, materials, and workmanship in the completed Work shall match accepted Samples.

## **1.6 INSTALLATION, OPERATION, AND MAINTENANCE MANUAL**

- A. Sheet Size: 8½ x 11 inch
- B. Drawing Size: Reduce drawings or diagrams to an 8½ x 11 inch or 11 x 17 inch size. However, where reduction is not practical to ensure readability, fold larger drawings separately and place in vinyl envelopes bound into the binder. Identify vinyl envelopes with drawing numbers.

- C. Binding: Bind in stiff, metal-hinged, three-ring binder(s) with standard three-hole punching.
- D. Multiple Items: Multiple items may be combined into one binder; tab each section with plastic-coated dividers.
- E. Page Protectors: Provide plastic sheet lifters prior to first page and following last page.
- F. Binder title: Include the following title on front and spine of binder:

PETALUMA REGIONAL LIBRARY RENOVATION

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL, [ENTER DATE]

G. Contents:

1) Introductory Information:

- a. Title page providing the same information as paragraph 1.6F above
- b. Contractor's name, address, and telephone number
- c. Table of Contents

2) Contractor shall include, at a minimum, the following detailed information for each item as applicable and as required by individual Specification Sections:

- a. Equipment function, normal operating characteristics, limiting operations.
- b. Assembly, disassembly, installation, alignment, adjustment, and checking instructions.
- c. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions.
- d. Lubrication and maintenance instructions including specific type and amount of lubricant and recommended lubrication interval.
- e. Guide to "troubleshooting."
- f. Parts list and predicted life of parts subject to wear.
- g. Outline, cross-section, and assembly drawings; engineering data; and electrical diagrams, including elementary diagrams, labeled wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.
- h. Test data and performance curves.
- i. A list of recommended spare parts with a price list and a list of spare parts provided under this Contract.
- j. Copies of parts lists or other documents packed with equipment when delivered.

- k. Instrumentation or tag numbers relating the equipment back to the Contract Documents.

3) Index

**1.7 COMPUTER PROGRAMS**

- A. When any equipment requires operation by computer programs, Contractor shall submit copy of program on appropriate diskette plus all user manuals and guides for operating the programs and making changes in the programs for upgrading and expanding the databases. Program shall be Windows compatible. Contractor shall provide required licenses to Library at no additional cost.

**1.8 PROJECT RECORD DOCUMENTS**

- A. Submit Project Record Documents as required by Section 017839 (Project Record Documents).

**1.9 PROJECT DELAY CAUSED BY SUBMITTAL DELAY**

- A. Any Project delay which is caused by Contractor delay in submitting Submittals is considered avoidable delay, and will not be a basis for extension of Contract Time. Liquidated damages incurred because of late Submittals will be assessed to Contractor as otherwise provided in Contract Documents.

END OF SECTION

## SECTION 014100

### REGULATORY REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes: regulatory requirements applicable to Contract Documents.
- B. Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
- C. Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a Change Order detailing and specifying the required Work shall be submitted to and approved by Library before proceeding with the Work.

##### 1.2 REFERENCES TO REGULATORY REQUIREMENTS

- A. Codes, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these Specifications. Code, laws, ordinances, rules and regulations are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements. The listing of applicable codes, laws, and regulations for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor's responsibility for complying with all applicable laws, regulations, or ordinances having application to the Work. Where conflict among the requirements or with these Specifications occurs, the most stringent requirements shall be used.
- B. Conform to referenced codes, laws, ordinances, rules and regulations.

##### 1.3 CODES

- A. Codes that may apply to Contract Documents include, but are not limited to, the following:
  - 1) CBC (Part 2, Title 24, CCR, including, without means of limitation, Sections 16A, 102A.23, 308, 420A, 504-506, 904.2.6, 1019 and 1604)
  - 2) CEC (Part 3, Title 24, CCR)
  - 3) CMC (Part 4, Title 24, CCR)



- 4) CPC (Part 5, Title 24, CCR),
- 5) California Energy Code (Part 6, Title 24 CCR)
- 6) State Elevator Safety Regulations (Part 7, Title 24, CCR)
- 7) California Green Building Standards Code (CALGreen) (Part 11, Title 24, CCR)
- 8) UBC
- 9) UPC
- 10) UMC
- 11) NEC

#### **1.4 LAWS, ORDINANCES, RULES, AND REGULATIONS**

- A. During prosecution of Work to be done under Contract Documents, comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:
  - 1) Federal:
    - a. Americans With Disabilities Act of 1990
    - b. 29 CFR, Section 1910.1001, Asbestos
    - c. 40 CFR, Subpart M, National Emission Standards for Asbestos
    - d. Executive Order 11246
    - e. Federal Endangered Species Act
    - f. Clean Water Act
  - 2) State of California:
    - a. California Code of Regulations, Titles 5, 8, 19, 21, 22, 24 and 25
    - b. California Public Contract Code
    - c. California Health and Safety Code
    - d. California Government Code
    - e. California Labor Code
    - f. California Civil Code
    - g. California Code of Civil Procedure
    - h. CPUC General Order 95, Rules for Overhead Electric Line Construction

- i. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
  - j. Cal/OSHA
  - k. OSHA: Hazard Communications Standards
  - l. California Endangered Species Act
  - m. Water Code
  - n. Fish and Wildlife Code
- 3) State of California Agencies:
- a. State and Consumer Services Agency
  - b. Office of Statewide Health Planning and Development
  - c. Department of Fish and Wildlife
  - d. Bay Area Air Quality Management District
  - e. San Francisco Bay Regional Water Quality Control Board
  - f. North Coast Regional Water Quality Control Board
    - 1) Order No. 93-61
    - 2) Order No. 81-73
    - 3) Clean Water Act Section 401
- 4) Local Agencies:
- a. Applicable County of Sonoma and City of Petaluma Ordinances
  - b. Northern Sonoma County Air Pollution Control District
- 5) Other Requirements:
- a. National Fire Protection Association (NFPA): Pamphlet 101, Life Safety.
  - b. References on Drawings or in Specifications to “code” or “building code” not otherwise identified shall mean the codes specified in this Document 014100, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction.
- B. Have access to all of the foregoing within 24 hours.
- C. Other Applicable Laws, Ordinances and Regulations:
- 1) Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of federal, state, and local governmental agencies and jurisdictions having authority over the Project.

- 2) Work shall be accomplished in conformance with all rules and regulations of public utilities and utility districts.
  - 3) Where such laws, ordinances rules, and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules, and regulations occur subsequent to the time of opening of the Bids.
- D. Change Orders and Claims. The California Public Contract Code (including but not limited to Section 7105(d)(2)) and the California Government Code (Section 930.2, et seq.) apply to all contract procedures for changes, time extensions, change orders (time and money), and claims. Federal law (U.S. v. Holpuch 326 U.S. 234) shall supplement but not supercede California law on these requirements. Any change, alteration, Modifications, waiver, or omission to implement these procedures, shall have no legal effect unless approved in advance in a fully executed Change Order approved by the Library's Commission or the Library official it designates for that purpose.

## **1.5 PRECEDENCE**

- A. Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, Drawings and Specifications shall take precedence so long as such increase is legal.
- B. Where no requirements are identified on Drawings or in Specifications, comply with all requirements of applicable codes, ordinances and standards of governing authorities having jurisdiction.
- C. Conflicts between referenced regulatory requirements: comply with the one establishing the more stringent requirement.
- D. Conflicts between referenced regulatory requirements and Contract Documents: comply with the one establishing the more stringent requirement.

## **1.6 REQUIRED PROVISIONS ON CONTRACT CLAIM RESOLUTION**

- A. The California Public Contract Code specifies required provisions for resolving contract claims less than \$375,000, which are set forth below, and constitute a part of this Contract.
  - 1) For the purposes of this section, "Claim" means a separate demand by Contractor of \$375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by Library. In order to qualify as a Claim, the written demand must state that it is a Claim

submitted under paragraph 12 of Document 007200 (General Conditions) and be submitted in compliance with all requirements of Document 007200 (General Conditions), paragraph 12. Separate Claims which total more than \$375,000 do not qualify as a “separate demand of \$375,000 or less,” as referenced above, and are not subject to this section.

- 2) A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in compliance with Contract Documents claim submission requirements.
- 3) Note: This section does not apply to tort claims and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.

**B. Procedure:**

- 1) The Claim must be in writing, submitted in compliance with all requirements of Document 007200 (General Conditions), Article 12, including, but not limited to, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Document 007200 (General Conditions), paragraph 12.3. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 007200 (General Conditions), Article 12 or elsewhere in the Contract Documents.
- 2) For Claims of Fifty Thousand Dollars (\$50,000) or less
  - a. Library shall respond in writing within forty-five (45) days of receipt of the Claim, or
  - b. Library may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Library may have against Claimant.
    - 1) If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Library and Claimant.
    - 2) Library’s written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
- 3) For Claims over Fifty Thousand Dollars (\$50,000) and less than or equal to Three Hundred Seventy-Five Dollars (\$375,000):

- a. Library shall respond in writing within sixty (60) days of receipt of the Claim, or
  - b. Library may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Library may have against Claimant.
    - 1) If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Library and Claimant;
    - 2) Library's written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
- 4) Meet and Confer:
- a. If Claimant disputes Library's written response, or Library fails to respond within the time prescribed above, Claimant shall notify Library, in writing, either within fifteen (15) days of receipt of Library's response or within fifteen (15) days of Library's failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand Library will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.
  - b. Following the meet and confer conference, if the Claim or any portion remains in dispute, 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 California 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 Claimant submits its written Claim as set forth in paragraph 1.6.B above, 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.

**1.7 COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT**

- A. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services, and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state, and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits, or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents, or assigns shall constitute a material breach of the Contract Documents.

**1.8 CAL/OSHA PERMIT. OBTAIN, AS APPLICABLE, PERMIT(S) AS REQUIRED BY CAL/OSHA FOR THE FOLLOWING:**

- A. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.
- B. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).
- C. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).

**1.9 BUILDING PERMIT(S)**

- A. All permits that may be required for the Work, such as building permits, deferred submittals (underground fire protection water supply system, fire sprinkler system, fire alarm system, fuel storage and tank, and kitchen exhaust hood systems), electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, etc., shall be obtained by Contractor. Applicable permit fees will be reimbursed by Library to the extent specified in Document 007200 (General Conditions).

END OF SECTION

## SECTION 014200

### REFERENCES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes: Reference standards, abbreviations, symbols, definitions, and terminology used in Contract Documents.
- B. Full titles are given in this Section for standards cited in other Sections of Specifications.
- C. Material and workmanship specified by reference to number, symbol, or title of specific standard such as state standard, commercial standard, federal specifications, technical society, or trade association standard, or other similar standard, shall comply with requirements of standards except when more rigid requirements are specified or required by applicable codes.
- D. Standards referred to, except as modified herein, shall have full force and effect as though printed in the Contract Documents. Standards are not furnished to Contractor because manufacturers and trades involved are assumed to be familiar with their requirements.

##### 1.2 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES

- A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or laws or regulations (including all amendments, changes, errata, addenda, and supplements) in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
  - 1) When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of opening Bids.
    - a. Exception: Comply with issues in effect as listed in governing legal requirements.
- B. If during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual, or code, or of any instruction of any supplier, report it in writing at once by submitting a RFI to Library, and do not proceed with the Work affected thereby until consent to do so is given by Library.
- C. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, CCD, or Supplemental Instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
  - 1) The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
  - 2) The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
- D. No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of Library, Contractor, or Architect, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to Library, Architect, or any of their consultants, agents, representatives or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.
- E. Comply with the applicable portions of standards and specifications published by the technical societies, institutions, associations, and governmental agencies referred to in

- Specifications.
- F. Referenced Grades, Classes, and Types: Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the highest, best, and greatest of the alternatives or options for the intended use and prevailing conditions.
  - G. Jobsite Copies:
    - 1) Obtain and maintain at the Site copies of reference standards identified on Drawings and in Specifications in order to properly execute the Work.
    - 2) At a minimum, the following shall be readily available at the Site:
      - a. Safety Codes: State of California, Division of Industrial Safety regulations.
  - H. ASTM and ANSI References: Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision, or amendment. It is presumed that Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

### 1.3 ABBREVIATIONS

- A. Listed hereinafter are the various organizations or references which may appear in the Contract Documents, along with their respective acronyms and/or abbreviations:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AAP	Affirmative Action Program
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Bearing Manufacturers Association
ABPA	American Board Products Association
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AED	Association of Equipment Distributors
AFBMA	Anti-friction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute (formerly American Standards Association)
APA	American Plywood Association
ARI	Air-Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industries
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIL	Basic Insulation Level
CALGreen	California Green Building Standards Code, T-24 Part 11
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	State of California, Department of Transportation
CBC	California Building Code
CCD	Construction Change Directive



CCR	California Code of Regulations
CEC	California Electric Code
CFR	Code of Federal Regulations
CI	Chlorine Institute, Inc.
CISPI	Cast Iron Soil Pipe Institute
CLMFI	Chain Link Fence Manufacturers Institute
CMAA	Crane Manufacturers Association of America, Inc.
CMC	California Mechanical Code
CO	Change Order
COE	United States Army Corps of Engineers
CPC	California Plumbing Code
CPM	Critical Path Method
CPUC	California Public Utilities Commission
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards, U.S. Department of Commerce
CSA	Canadian Standards Association
CTI	Ceramic Tile Institute
DHI	Door and Hardware Institute
DSA	Division of State Architect (formerly known as the Office of the State Architect)
EIA	Electronic Industries Association
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories
FGMA	Flat Glass Marketing Association
FM	Factory Mutual
FMRC	Factory Mutual Research Corporation
FS	Federal Specifications
GA	Gypsum Association
HI	Hydraulic Institute
HMMA	Hollow Metal Manufacturer's Association
HPMA	Hardwood Plywood Manufacturers Association
HVAC	Heating, Ventilating and Air Conditioning
I.D.	Identification
IACS	International Annealed Copper Standards
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers, Inc.
IES	Illuminating Engineering Society
ISA	The Instrumentation, Systems, and Automation Society
ISA	Instrumentation Society of America
ISO	International Organization for Standardization
JATC	Joint Apprenticeship Training Committee
JV	Joint Venture
LBE	Local Business Enterprise
M.I.	Middle Initial
M/WBE	Minority and/or Woman-Owned Business Enterprise
MBE	Minority Business Enterprise
MIA	Masonry Institute of America
MIA	Marble Institute of America
MLSFA	Metal Lath/Steel Framing Association
MS	Military Specifications
MSDS	Material Safety Data Sheet
MSS	Manufacturers Standardization Society of the Valve & Fitting Industry
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers

NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
NESC	National Electrical Safety Code
NFoPA	National Forest Products Association
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NOFMA	National Oak Flooring Manufacturers Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NTMA	National Terrazzo & Mosaic Association
NWWDA	National Wood Windows and Doors Association
OSHA	Occupational Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Department
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PG&E	Pacific Gas and Electric Company
PM	Preventive Maintenance
PR	Proposal Request
PRMD	Permits and Resource Management Department, County of Sonoma
PS	Product Standard, U. S. Department of Commerce
RFI	Request for Information
RFP	Request for Proposals
RFS	Request for Substitution
RIS	Redwood Inspection Service
SAE	Society of Automotive Engineers
SDoI	Steel Door Institute
SDeI	Steel Deck Institute
SFM	State of California, Office of State Fire Marshal
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joint Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SSPC	Steel Structures Painting Council
SWI	Steel Window Institute
TCA	Tile Council of America
TIE	Time Impact Evaluation
TMS	The Masonry Society
TPI	Truss Plate Institute Inc.
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters' Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USA	Underground Service Alert
USC	United States Code
WCLIB	West Coast Lumber Inspection Bureau
WHI	Warnock Hersey International
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association
WWPI	Western Wood Preservers Institute

B. Abbreviations in Specifications:

AWG	American Wire Gauge
accord	Accordance
Co.	Company
Corp.	Corporation
cm.	centimeter (centimeters)
cu.	Cubic
Div.	Division
dia.	diameter
ft.	foot (feet)
g./gr.	gram (grams)
gal.	gallon (gallons)
gpd	gallons per Day
gpm	gallons per minute
hr.	hour
kg.	kilogram (kilograms)
in.	inch (inches)
Inc.	Incorporated
km.	kilometer (kilometers)
kVAR	Kilovolts amperes reactive
kW	Kilowatt
l.	liter (liters)
lbs.	pounds
m	meter (meters)
Mfg.	manufacturing
mg.	milligram (milligrams)
ml./mls.	milliliter (milliliters)
mm.	millimeter (millimeters)
No.	number
o.c.	on centers
O.D.	outside diameter
psi	pounds per square inch
psf	pounds per square foot
sq.	square
T & G	tongue and groove
U.S.	United States
yd.	yard (yards)

C. Abbreviations on Drawings:

- 1) Additional abbreviations, used only on Drawings, are indicated thereon.

**1.4 SYMBOLS**

A. Symbols in Specifications:

:	“shall be” or “shall” - where used within sentences or paragraphs
#1	Number
1#	Pound
&	And
%	Percent
C	Centigrade
F	Fahrenheit
°	Degree
/	per, except where used to combine words; example: power/fuel, and in that case it means and
“	inch (inches)
‘	foot (feet)

@ At

- B. Symbols on Drawings:
  - 1) Symbols, used only on Drawings, are indicated thereon.

## 1.5 DEFINITIONS

- A. Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth. In the Contract Documents, the neuter gender includes the feminine and masculine, and the singular number includes the plural.
- B. While Library has made an effort to identify all defined terms with initial caps, the following definitions shall apply regardless of case unless the context otherwise requires:
  - 1) Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-Bid Conference and/or Site Visit.
  - 2) Agreement Form (Document 005213): This Agreement is the basic Contract Document that binds the parties to construction Work. Agreement defines relationships and obligations between Library and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract Documents.
  - 3) Alternate: Work added to or deducted from the Base Bid, if accepted by Library.
  - 4) Application for Payment: Written application for monthly or periodic progress or final payment made by Contractor complying with the Contract Documents.
  - 5) Approved Equal: Approved in writing by Library as being of equivalent quality, utility and appearance.
  - 6) Architect: The individual (or firm including the individual) holding a valid California State Architect's license designated within the Contract Documents as Architect to provide architectural and/or engineering services on the Project. When Architect is referred to within the Contract Documents and no Architect has in fact been designated, then the matter shall be referred to Library. The term Architect shall be construed to include all of Architect's consultants retained for the Project, as well as employees of Architect. When the designated Architect is an employee of Library, his or her authorized representatives on the Project will be included under the term Architect, and Architect is the beneficiary of all Contractor obligations to Library, including without limitation, all releases and indemnities.
  - 7) Architect's Supplemental Instruction ("ASI"): A written clarification of Contract Documents issued by Architect that does not result in change in Contract Sum or Contract Time, nor substantially changes Drawings or Specifications. See Document 01250 (Clarification and Modification Procedures).
  - 8) Asbestos: Any material that contains more than one (1) percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.
  - 9) Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.
  - 10) Bidder: One who submits a Bid to the Library.
  - 11) Bidding Documents: All documents comprising the Project Manual (including all documents and Specification Sections listed in Document 00010 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.
  - 12) Business Day: Any Day other than Saturday, Sunday, and the following days that have been designated as holidays by Library. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday.
    - a. New Year's Day, January 1;
    - b. Martin Luther King Jr.'s Birthday, third Monday in January;
    - c. Lincoln's Birthday, February 12;

- d. Presidents' Day, third Monday in February;
  - e. Memorial Day, last Monday in May;
  - f. Independence Day, July 4;
  - g. Labor Day, first Monday in September;
  - h. Veterans' Day, November 11;
  - i. Thanksgiving Day, as designated by the President;
  - j. The Day following Thanksgiving Day;
  - k. Christmas Day, December 25; and
  - l. Each day appointed by the Governor of California and formally recognized by the Sonoma Library Board of Supervisors as a day of mourning, thanksgiving, or special observance.
- 13) Change Order: A written instrument prepared by Library and signed by Library and Contractor, stating their agreement upon all of the following:
- a. a change in the Work;
  - b. the amount of the adjustment in the Contract Sum, if any; and
  - c. the amount of the adjustment in the Contract Time, if any.
- 14) Claim: Is defined in Document 007200 (General Conditions).
- 15) Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.
- 16) Commencement Date: The date on which Contract Time commences to run as provided in the Contract Documents.
- 17) Construction Change Directive ("CCD"): A written order prepared and signed by Library, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.
- 18) Consultant: A consultant is an expert or a professional in a specific field and has a wide knowledge of the subject matter.
- 19) Contract Conditions or Conditions of the Contract: Consists of two parts: General Conditions and Supplementary Conditions.
- a. General Conditions are general clauses that are common to Library Contracts, including Document 007200 (General Conditions).
  - b. Supplementary Conditions modify or supplement General Conditions to meet specific requirements for these Contract Documents, including Document 007300 (Supplementary Conditions) and Document 007316 (–Insurance Requirements) and Document 007373 (Statutory Requirements – Apprenticeship Program) (if used).
- 20) Contract Documents and Contract: Contract Documents and Contract shall consist of the documents identified as the Contract Documents in Document 005213 (Agreement Form – Stipulated Sum), plus all changes, Addenda, and Modifications thereto.
- 21) Contract Modification: Either:
- a. a written amendment to Contract signed by Contractor and Library; or
  - b. a Change Order; or
  - c. a Construction Change Directive; or
  - d. a written directive for a minor change in the Work issued by Library.
- 22) Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by Library to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.
- 23) Contract Time: The number or numbers of Days or the dates stated in the Agreement:
- a. to achieve Substantial Completion of the Work or designated Milestones; and/or
  - b. to complete the Work so that it is ready for final payment and is accepted.
- 24) Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term "Contractor" includes Contractor or its authorized representative.
- 25) Contractor's Employees: Persons engaged in execution of Work under Contract as

direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.

- 26) Library: Sonoma County Library
- 27) Library-Furnished, Contractor-Installed: Items furnished by Library at its cost for installation by Contractor at its cost under Contract Documents.
- 28) Library's Representative(s): See Document 005213 (Agreement Form – Stipulated Sum).
- 29) Day: One calendar day of twenty-four (24) hours measured from midnight to the next midnight, unless the word "day" is specifically modified to the contrary.
- 30) Defective: An adjective which, when modifying the word "Work," refers to Work that is unsatisfactory or unsuited for the use intended, faulty or deficient, that does not conform to the Contract Documents, or breaches any express or implied warranty or guaranty, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of Samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Library). Library is the judge of whether Work is Defective.
- 31) Disputed Work: As defined in Document 007200 (General Conditions), Article 12.
- 32) Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 33) Engineer: If used elsewhere in the Contract Documents, "Engineer" shall mean an individual (or firm including the individual) holding a valid California State Architect's or Engineer's license designated within the Contract Documents as Engineer to provide engineering and/or architectural services on the Project. Engineer may be an employee of or an independent consultant to Library. When Engineer is referred to within the Contract Documents and no Engineer has in fact been designated, then the matter shall be referred to Library. The term Engineer shall be construed to include employees of Engineer and/or employees that Engineer supervises. When Engineer is an employee of Library, his or her authorized representatives on the Project will be included under the term Engineer. If Architect is an employee of Library, Engineer is the beneficiary of all Contractor obligations to Library, including without limitation, all releases and indemnities.
- 34) Equal: Equal in opinion of Library. Burden of proof of equality is responsibility of Contractor.
- 35) Final Acceptance or Final Completion: Library's acceptance of the Work as satisfactorily completed in accordance with Contract Documents, as evidence by Library's issuance of Final Inspection Report. Requirements for Final Acceptance/Final Completion include, but are not limited to:
  - a. All systems having been tested and accepted as having met requirements of Contract Documents.
  - b. All required instructions and training sessions having been given by Contractor.
  - c. All Project Record Documents having been submitted by Contractor, reviewed by Library, and accepted by Library.
  - d. All punch list Work, as directed by Library, having been completed by Contractor.
  - e. Generally all Work, except Contractor maintenance after Final Acceptance/Final Completion, having been completed to satisfaction of Library.
- 36) Final Inspection Report: Document issued by Library to indicate Final Completion has occurred.
- 37) Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
- 38) Guaranty Period: Is defined in Document 006536 (Warranty Form).
- 39) Initial Schedule: See Document 013200 (Construction Progress Documentation).

- 40) Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
- 41) Modification: Same as Contract Modification.
- 42) Not in Contract: Work that is outside the scope of Work to be performed by Contractor under Contract Documents.
- 43) Notice of Completion: Shall have the meaning provided in California Civil Code Section 9204, and any successor statute.
- 44) Notice of Potential Claim: As described in Document 007200 (General Conditions), Article 12.
- 45) Off Site: Outside geographical location of the Project.
- 46) Original Schedule: See Document 013200 (Construction Progress Documentation).
- 47) Partial Utilization: Use by Library of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.
- 48) PCBs: Polychlorinated byphenyls.
- 49) Phase: A specified portion of the Work (if any) specifically identified as a Phase in Document 005213 (Agreement Form) or Document 011000 (Summary).
- 50) Product Data: That information (brochures, catalog sheets, manufacturer's data sheets, etc.) supplied by vendors having technical and commercial characteristics of the supplied equipment or materials and accompanying commercial terms such as warranties, instructions, and manuals.
- 51) Progress Report: A periodic report submitted by Contractor to Library with progress payment invoices accompanying progress schedule. See Document 013200 (Construction Progress Documentation) and Document 007200 (General Conditions).
- 52) Project: Total construction of which Work performed under Contract Documents may be whole or part.
- 53) Project Inspector: A person(s) subcontracted to testing and special inspection agency or engaged directly by Library to provide general observation of the Work, scheduling requested inspections by Contractor and reporting to Library.
- 54) Project Manager: See Library Representative.
- 55) Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, Drawings, and Specifications.
- 56) Project Record Documents: All Project deliverables required under Sections 01700 et seq., including without limitation, as-built drawings; Installation, Operation, and Maintenance Manuals; and Machine Inventory Sheets.
- 57) Request for Information ("RFI"): A document prepared by Contractor or Library requesting information regarding the Project or Contract Documents as provided in Document 012600 (Contract Modification Procedures). The RFI system is also a means for Library to submit Contract Document clarifications or supplements to Contractor.
- 58) Request for Proposals ("RFP"): A document issued by Library to Contractor whereby Library may initiate changes in the Work or Contract Time as provided in Contract Documents. See Document 012600 (Contract Modification Procedures).
- 59) Request for Substitution ("RFS"): A document prepared by Contractor requesting substitution of materials as permitted and to the extent permitted in Contract Documents. See Document 016000 (Product Requirements).
- 60) RFI-Reply: A document consisting of supplementary details, instructions, or information issued by Library that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by Library. RFI-Replies will be issued through the RFI administrative system.
- 61) Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- 62) Schedule of Values ("SOV"): The detailed breakdown of Contractor's Bid by scheduled Work items and/or activities, to be used as a basis for Applications of

- Payment and as described in Document 012000 (Price and Payment Procedures).
- 63) Serving Utilities: Is a source or entity that provides utility services; electricity, gas, water, or sewer.
  - 64) Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
  - 65) Site: The particular geographical location of Work performed pursuant to Contract Documents.
  - 66) Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services; and are contained in Divisions 1 through 49.
  - 67) Subcontractor: A person or entity that has a direct contract with Contractor to perform a portion of the Work at the Site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and neutral in gender and includes Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.
  - 68) Submittal: Includes shop drawings, material data, samples produced by Contractor, and other items referenced or described in Document 013300 (Submittal Procedures).
  - 69) Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of Library as evidenced by a Certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of Library for final payment. The terms "Substantially Complete" and "Substantially Completed" as applied to all or part of the Work refer to Substantial Completion thereof.
  - 70) Superintendent: A construction superintendent is Contractor's representative who is responsible for continuous field supervision, coordination, and completion of the work.
  - 71) Supplemental Instruction ("SI"): See Architect's Supplemental Instruction above.
  - 72) Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: Electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems, or water.
  - 73) Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Document 005213 (Agreement Form – Stipulated Sum) or Document 011000 (Summary).
  - 74) Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word "work" is used, rather than the word "Work," it shall be understood to have its ordinary and customary meaning.
- C. The following terms are not necessarily identified with initial caps; however they shall have the meaning set forth below:
- 1) Wherever words "as directed," "as required," "as permitted," or words of like effect are used, it shall be understood that direction, requirements, or permission of Library is intended. Words "sufficient," "necessary," "proper," and the like shall mean sufficient,



- necessary, or proper in judgment of Library. Words “approved,” “acceptable,” “satisfactory,” “favorably reviewed,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by Library.
- 2) Wherever the word “may” or “ought” is used, the action to which it refers is discretionary. Wherever the word “shall” or “will” is used, the action to which it refers is mandatory.
  - 3) By Library: Work that will be performed by Library or its agents at Library’s expense.
  - 4) By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by Library, other contractors, or other means.
  - 5) Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.
  - 6) Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
  - 7) Furnish: Supply only, do not install.
  - 8) Indicated: Shown or noted on the Drawings.
  - 9) Install: Install or apply only, do not furnish.
  - 10) Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under Document 007200 (General Conditions).
  - 11) Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions.
  - 12) Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
  - 13) Provide: Furnish and install.
  - 14) Shown: As indicated on Drawings.
  - 15) Specified: As written in Specifications.
  - 16) Testing and special inspection agency: An independent entity engaged by Library to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.

END OF SECTION

## SECTION 014500

### QUALITY CONTROL

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Contractor's Quality Control
- B. Quality of the Work
- C. Inspections and Tests by Governing Authorities
- D. Inspections and Tests by Serving Utilities
- E. Inspections and Tests by Manufacturer's Representatives
- F. Tests and Inspections by Library Independent Testing and Inspection Agency
- G. Additional Testing and Inspection

##### 1.2 CONTRACTOR'S QUALITY CONTROL

- A. Contractor's Quality Control: Ensure that products, services, workmanship, and Site conditions comply with requirements of Drawings and Specifications by coordinating, supervising, testing, and inspecting the Work and by utilizing only suitably qualified and appropriately audited, licensed, or trained personnel.
- B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of Drawings and Specifications, including, by reference, all codes, laws, rules, regulations, and standards. When no quality basis is prescribed, the quality and testing procedures shall be in accordance with the best-accepted practices of the construction industry for the locale of the Project, for projects of this type, or standards set by engineering or technical societies (e.g., ASTM or ASHRAE), whichever is more stringent.
- C. Quality Control Personnel: Employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

##### 1.3 QUALITY OF THE WORK

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects, and fit for the intended use.

- B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements, as shown on or required by Contract Documents.
- C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling, and staining, until acceptance by Library.
- D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting, and finishing Work.
- E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Secure Library's advanced written consent. Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
- F. Verification of Quality: Work shall be subject to verification of quality by Library in accordance with provisions of the Contract Documents.
  - 1) Cooperate by making Work available for inspection.
  - 2) Such verification may include mill, plant, shop, or field inspection as required.
  - 3) Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
  - 4) Provide all information and assistance as required, including that by and from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by Library.
  - 5) Applicable provisions of the Contract Documents shall govern Contract Modifications, if any, resulting from such verification activities.
- G. Observations by Library's Consultants: Periodic and occasional observations of Work in progress will be made by Library and Library's consultants as deemed necessary to review progress of Work and general conformance with design intent.
- H. Limitations on Inspection, Test, and Observation: Neither employment of independent testing and inspection agency nor observations or tests by Library and Library's consultants shall in any manner relieve Contractor of obligation to perform Work in full conformance to all requirements of Contract Documents.
- I. Library's Acceptance and Rejection of Work: Library reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications, or otherwise Defective.

- J. Correction of Defective Work: Defective Work shall be modified, replaced, repaired or redone by Contractor at no change in Contract Sum or Contract Time.
- K. Acceptance of Defective Work: Acceptance of Defective Work, without specific written acknowledgement and approval of Library, shall not relieve Contractor of the obligation to correct such Work.
- L. Contract Adjustment for Defective Work: Should Library determine that it is not feasible or in Library's interest to require Defective Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between Library and Contractor. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of Document 007200 (General Conditions).
- M. Non-Responsibility for Defective Work: Library and Library's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications.
- N. Responsibility for Defective Work: Contractor shall have full responsibility for all consequences resulting from Defective Work, including without limitation all delays, disruptions, extra inspection and correction costs by Contractor and Library and re-Work, and extra time and costs of all types. Contractor waives excuses for defective work relating to Library's prior review of Submittals and/or prior failure to notice Defective Work in place on inspection.

#### **1.4 INSPECTIONS AND TESTS BY GOVERNING AUTHORITIES**

- A. Regulatory Requirements for Testing and Inspection: Comply with UBC requirements, including specific requirements of the building permit, if any, and all other requirements of governing authorities having jurisdiction.
- B. Inspections and Tests by Governing Authorities: Cause all tests and inspections required by governing authorities having jurisdiction to be made for Work under this Contract. Except as specifically noted, scheduling, conducting and paying for such inspections shall be solely Contractor's responsibility.

#### **1.5 INSPECTIONS AND TESTS BY SERVING UTILITIES**

- A. Inspections and Tests by Serving Utilities: Cause all tests and inspections required by serving utilities to be made for Work under this Contract. Scheduling, conducting, and paying for such inspections shall be solely Contractor's responsibility.

#### **1.6 INSPECTIONS AND TESTS BY MANUFACTURER'S REPRESENTATIVES**

- A. Inspections and Tests by Manufacturer's Representatives: Cause all tests and inspections specified to be conducted by materials or systems manufacturers to be made. Additionally, all tests and inspections required by materials or systems manufacturers as

conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum.

**1.7 TESTS AND INSPECTIONS BY LIBRARY OR INDEPENDENT TESTING AND INSPECTION AGENCY**

- A. Library will conduct or Library will select an independent testing and inspection agency or agencies to conduct tests and inspections as indicated on Drawings, in Specifications, and as required by governing authorities having jurisdiction.
- B. Responsibility for payment for tests and inspections shall be as indicated in paragraph C and 1.8 below. All time and costs for Contractor's service related to such tests and inspections shall be included in Contract Time and Contract Sum.
- C. All additional charges by testing and inspection agencies and governing authorities having jurisdiction shall be deducted from the Contract Sum due to the following:
  - 1) Contractor's failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
  - 2) Changes in sources, lots, or suppliers of products after original tests or inspections.
  - 3) Changes in means, methods, techniques, sequences, and procedures of construction that necessitate additional testing, inspection, and related services.
  - 4) Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.
  - 5) Contractor submitted requests to change materials or products, which are accepted, but require testing and/or re-inspection beyond original design.
- D. Contractor Responsibilities for Inspections and Tests:
  - 1) Unless specified otherwise, Contractor shall notify Library and testing agency twenty-four (24) hours in advance of expected time of each test and inspection, and for all other operations requiring inspection and testing services, by submitting Contractor's inspection request in writing (or, if Library provides a specific form, on that form).
    - a. When tests or inspections cannot be performed after such notice, reimburse Library for testing and inspection agency personnel and travel expenses incurred due to Contractor's negligence.
    - b. For local fire inspections, notify Library twenty-four (24) hours in advance of expected time of each test and inspection.

- 2) Deliver to laboratory or designated location, adequate samples of materials proposed to be used that require advance testing, together with proposed mix designs.
- 3) Cooperate with testing and inspection agency personnel, Library, and Library's consultants. Provide access to Work areas and off-Site fabrication and assembly locations, including during weekends and after normal Work hours.
- 4) Provide incidental labor and facilities to provide safe access to Work to be tested and inspected, to obtain and handle Samples at the Site or at source of products to be tested, and to store and cure test Samples.
- 5) Provide, at least fifteen (15) Days in advance of first test or inspection of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.

## **1.8 ADDITIONAL TESTING AND INSPECTION**

- A. If initial tests or inspections made by Library or the testing and inspection agency reveal that materials do not comply with Contract Documents, or if Library has reasonable doubt that materials do not comply with Contract Documents, additional tests and inspections shall be made as directed.
  - 1) If additional tests and inspections establish that materials comply with Contract Documents, Library shall pay all costs for such tests and inspections.
  - 2) If additional tests and inspections establish that materials do not comply with Contract Documents, all costs of such tests and inspections shall be deducted from Contract Sum.
  - 3) If Work requiring inspection is covered by follow-on or follow-up Work before it is inspected, uncover Work so proper inspections can be performed. All costs of such tests and inspections shall be deducted from Contract Sum.

END OF SECTION

**SECTION 014529**

**TESTING LABORATORY SERVICES**

**PART 1 GENERAL**

**3.1 SUMMARY**

- A. This Section describes testing and inspecting to be coordinated by Contractor and paid for by Library, if applicable.
- B. Related work:
  - 1) Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division-1 of these Specifications.
  - 2) Requirements for testing may be described in various Sections of these Specifications.

**3.2 QUALITY ASSURANCE**

- A. Provide the services of a testing laboratory approved by the Architect.
- B. Upon completion of each test and/or inspection, promptly distribute copies of test or inspection reports to the Architect, to governmental agencies requiring submission of such reports, and to such other persons as directed by the Architect.

**3.3 TESTS AND INSPECTIONS BY LIBRARY OR INDEPENDENT TESTING AND INSPECTION AGENCY**

- A. Tests and special inspections to be paid by Library include, but are not limited to, the following:
- B.

<u>Section</u>	<u>Material Tests</u>
051100	Structural steel bolting and welding

<u>Section</u>	<u>Special Inspection</u>
042700, 051100 & 055000	Installation of anchor bolts, post-installed anchors or dowels embedded in concrete
051100	Structural steel fabrication, erection, bolting and welding
061000	Horizontal wood diaphragms and shear wall nailing
075000	Installation of roof membrane

C. Test and Inspection Reports: After each inspection and test by an independent testing and inspection agency or agencies, one (1) copy of report shall be promptly submitted to Library, who will distribute copies to Contractor and any agency having jurisdiction (if required by Code).

- 1) Reports shall clearly identify the following:
  - a. Date issued.
  - b. Project name and number.
  - c. Identification of product and Specifications Section in which Work is specified.
  - d. Name of inspector.
  - e. Date and time of sampling or inspection.
  - f. Location in Project where sampling or inspection was conducted.
  - g. Type of inspection or test.
  - h. Date of test.
  - i. Results of tests.
  - j. Comments concerning conformance with Contract Documents and other requirements.

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- 2) Test reports shall indicate specified or required values and shall include statement whether test results indicate satisfactory performance of products.
- 3) Samples taken but not tested shall be reported.
- 4) Test reports shall confirm that methods used for sampling and testing conform to specified test procedures.
- 5) When requested, testing and inspection agency shall provide interpretations of test results.

## **PART 2 PRODUCTS**

### **3.4 SPECIFIC TESTS AND INSPECTIONS**

- A. Provide all tests and inspections required by governmental agencies having jurisdiction, required by provisions of the Contract Documents, including the Special Inspection and Testing Requirements form for the City of Petaluma, and such other tests and inspections as are directed by the Architect or Structural Engineer.
- B. Tests include, but are not necessarily limited to, those described in detail in Part 3 of this Document.

## **PART 3 EXECUTION**

### **3.5 TAKING SPECIMENS**

- A. Except as may be specifically otherwise approved by the Architect, have the testing laboratory secure and handle all samples and specimens for testing.

### **3.6 COOPERATION WITH TESTING LABORATORY**

- A. Contractor shall provide access to the Work at all times and at all locations where the Work is in progress. Contractor shall provide facilities for such access to enable the laboratory to perform its functions properly.

### **3.7 POST-INSTALLED ANCHOR SPECIAL INSPECTION AND TESTING**

- A. Refer to the structural drawings for requirements for special inspection during installation and testing of post-installed anchors.
- B. Provisions of applicable testing reports (e.g. ICC, IAPMO) shall be followed for installation of post-installed anchorage:

### **3.8 STRUCTURAL STEEL INSPECTING AND TESTING**

- A. Prior to use, test all structural steel for compliance with the specified standards.
  - 1) Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing.
  - 2) Require the supplier to furnish mill test reports to the laboratory for certification.
  - 3) Tag identified steel at the supplier's shop
  - 4) When steel arrives at the job site without such tags, test it as unidentified steel.
- B. Unidentified steel:
  - 1) Have testing laboratory make one tensile test and one bend test for each five tons or fraction thereof of each shape and size of unidentified structural steel.
- C. Shop welding:
  - 1) Provide qualified testing laboratory inspector.
  - 2) On single pass welds, inspect after completion of welding and prior to painting.
  - 3) On multiple pass welds, and on butt welds with cover pass on the back side, provide continuous inspection.
- D. Field welding: Provide continuous inspection by a qualified testing laboratory inspector.

### **3.9 ROOFING AND WATERPROOFING INSPECTING AND TESTING**

- A. Prior to start of membrane waterproofing and membrane roofing installation, conduct a job site meeting attended by representatives of the installing subcontractors, the contractor's field superintendent, the testing laboratory inspector, and the Architect, to agree upon procedures to be followed.

- B. Prior to start of installation, verify that materials at the job site comply with the specified standards, that the subcontractor is qualified to the extent specified, and that the installing personnel are fully informed as to procedures to be followed.
- C. During installation, verify that materials are installed in strict accordance with the manufacturer's recommendations as approved by the Architect.
- D. When so directed by the Architect, make test cuts to verify conformance with the specified requirements.

**3.10 WAIVER OF INSPECTION AND/OR TESTS**

- A. Specified inspections and/or tests may be waived only by the specific approval of Architect, and such waivers will be expected to result in credit to Library equal to normal cost of such inspection and/or test.

END OF SECTION

## SECTION 015000

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

- 1) Provide and maintain construction facilities and temporary controls as required to perform the Work; relocate as required by the progress of the Work.
- 2) Materials for construction facilities and temporary controls shall be suitable for the purposes intended and unless otherwise required by Library, may be new or used.
- 3) Materials, installation and maintenance of construction facilities and temporary controls shall be in compliance with applicable regulatory requirements.
- 4) Maintain construction facilities in sound, neat and clean condition. Remove any graffiti and repair any vandalism to satisfaction of Library.
- 5) Remove construction facilities and controls, including associated utilities and equipment, when their use is no longer required.
  - a. Remove and legally dispose of debris resulting from removal and reconditioning operations.
  - b. Restore or recondition, as applicable, areas of the site damaged or disturbed by the use of construction facilities and temporary controls.
- 6) Do not attach any temporary facilities and controls to existing finishes or components to remain without written permission from Library.

- ###### B. Related Sections:
- The completion of the work described in this Section may require work in or coordination with other sections of these specifications. Contractor and the subcontractor shall be responsible for identifying and including all related work in other Sections of these specifications and/or drawings necessary for a complete installation of the work described in this Section.

##### 1.2 TEMPORARY UTILITIES

- ###### A. Electric Power:
- Contractor may use existing Library provided electricity with Library's prior approval and provided that the existing service and distribution are suitable for Contractor's loads without causing disruption or interference with Library's use. If Contractor determines existing power is not adequate or suitable for the Work, Contractor shall provide, at no additional cost to Library, power service from appropriate Utility source.

- 1) Provide lighting and convenience outlets in the temporary structures, if any.
- 2) Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
- 3) Provide adequate distribution equipment, wiring, and outlets to provide branch circuits for power and lighting as required.
- 4) Provide adequate artificial lighting for work areas when natural lighting and permanent lighting is not available or adequate for performance of Work.

- ###### B. Water:
- Contractor may use existing Library provided water with Library's prior approval provided existing water system is adequate to the needs of the work without disruption or interference of Library's continued use. If existing water system is not adequate or suitable for the Work, Contractor shall arrange with utility service company to provide water for construction and other purposes such as final testing of plumbing and fire suppression systems; pay the costs for water used, sewer and related charges, permit and connection fees, if any.

- 1) If necessary, install temporary branch piping with taps located so that water is available throughout the Work by the use of hoses.
- 2) Make potable water available for human consumption.
- 3) As the work progresses protect existing interior finishes from damage by water.
- 4) Water may be available from fire hydrants located near the site. Obtain permission from the Fire Department to use the hydrants. Make all necessary arrangements with

- the Water Department, for the necessary installation of meters and payment of water used and related charges.
- a. Install temporary lines from the hydrants to the construction site, if needed.
  - b. Pipe crossing traveled roadways shall be buried beneath the roadway and shall comply with all traffic requirements of regulatory agencies.
  - c. Remove all temporary lines and related appurtenances upon completion of work and restore all facilities to conditions to conditions prior to construction to the satisfaction of Library.
- C. Heat and Ventilation: Provide temporary heating or ventilation as required, to maintain environmental conditions to facilitate progress of the Work, to prevent damage to building contents, or as required for worker or building occupant safety and comfort.
- 1) Meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to temperature and humidity conditions. Portable heaters, if used, shall be appropriate for the conditions and use.
  - 2) Provide temporary forced ventilation of enclosed areas for installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases, and as required to disperse odors and fumes in occupied buildings.
  - 3) Pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, temporary construction filters, strainers and guards required for the performance of the Work.
- D. Sanitary Facilities: Provide and locate temporary sanitary facilities as approved by Library.
- 1) Maintain in a neat, sanitary condition, with adequate supplies.
- E. Telephone: Arrange and pay for telephone service, and pay the costs throughout the duration of the Contract.
- F. Fire Protection: Contractor shall meet all fire protection requirements for the Work and if required by the responding firefighting agency shall submit Contractor's plans for fire protection and Fire Department access for fire fighting and equipment to Library for approval prior to commencing work at the project site.
- 1) Provide and maintain fire extinguishers, fire hoses, fire sprinklers, smoke detectors, controls and other equipment for fire protection in all areas of the Work and where materials are stored, in accordance with local and State fire codes and Cal-OSHA, whichever code is more stringent shall govern, and as directed by the Fire Department.
  - 2) Use fire protection equipment for fire protection only.
  - 3) Contractor shall maintain fire protection equipment, institute fire protection measures, and direct the prompt removal of unnecessary combustible materials and waste.
    - a. Contractor shall be responsible for overseeing correct and safe use of soldering coppers, extension lights, flammable liquids, welding and metal cutting apparatus, wax pots, and other flame tools.
    - b. Contractor shall be responsible to perform a walk-through before leaving the Site at the end of each work day to inspect the work areas for fire hazards.
    - c. Immediately mitigate all fire hazards.
  - 4) Take special precautions to minimize fire hazards when it becomes necessary to use stoves, tar pots or other temporary heating devices.
    - a. Such devices shall conform to the requirements of the National Fire Code of the NFPA and shall be used only under proper supervision.
    - b. Locate such devices so that there are minimum clearances in compliance with manufacturer's recommendations and regulatory requirements. Do not place within 10 feet of tarpaulins, canvas covers, loose paper or flammable material.
    - c. Properly insulate legs of temporary heating devices when it is necessary to place such equipment on combustible platforms.
    - d. Do not use heaters burning LP gas.
  - 5) Use special precautions to reduce fire hazard where electric or gas welding or cutting work is done. Provide and maintain suitable fire extinguishing equipment near such

welding operations.

- 6) Store paints, varnishes, volatile oils, and similar combustible materials in a non-combustible storage building having good ventilation and containing no other material, or in metal lockers or metal boxes with self-closing covers. Store gasoline and other volatile flammable liquids in metal barrels well away from structure or other combustible materials.
  - a. No storage of chemicals, solvents, paints, or other flammable materials will be allowed in the building.

### **1.3 CONSTRUCTION AIDS**

- A. Plant and Equipment: Furnish, operate, and maintain in safe and efficient operating condition a complete plant for fabricating, handling, conveying, applying, installing and erecting materials and equipment; and conveying systems for transporting workers.
  - 1) Include construction elevators, hoists, debris chutes and other equipment, tools and appliances necessary for performance of the Work.
- B. Construction Staging Areas: Construction staging shall be restricted to the areas approved by Library in writing. Contractor shall provide adequate measures including fencing and lighting if necessary to secure the staging and storage areas.

### **1.4 BARRIERS AND ENCLOSURES**

- A. General: Provide and maintain temporary barriers and enclosures at the site.
  - 1) Provide as required to protect the Work and existing facilities from the elements.
  - 2) Protect adjacent construction, improvements and persons from damage or injury from demolition and construction operations.
  - 3) Prevent unauthorized entry to construction areas.
  - 4) Protect vehicular and pedestrian traffic from injury or damage from Contractor's operations.
  - 5) Provide 8-foot high commercial grade chain link fence around construction site. Clamp and bolt fence sections together.
    - a. Equip with vehicular gates with vandal-resistant locks, all keyed alike.
- B. Public Thoroughfare: Except as indicated or otherwise approved, construction operations shall not occupy public sidewalks except where pedestrian protection is provided in accordance with the requirements of the Building Code and the regulations of public authorities having jurisdiction and as required by Library.
  - 1) Maintain and modify existing pedestrian walkways as required to conform with state and local Codes and Standards and shall comply with Americans with Disability Act (ADA) requirements for width, ramps, handrails, and access. Contractor shall clean any graffiti on barricade on a daily basis. Public thoroughfares shall be maintained free of debris and other construction material.
  - 2) Maintain at least one accessible path of travel around the construction site for persons with disabilities that conforms with the requirements of the State of California Title 24, Part 2 Accessibility Standards and the ADA.
  - 3) When Work is to be performed over an active public thoroughfare such as a sidewalk or building entrance, close thoroughfare if possible and approve by Library, or take other precautions such as installing screens or barricades.
    - a. When the exposure to heavy falling objects may exist, such as during the erection of building walls or during demolition, provide special protection of the type detailed in 29 CFR 1910/1926 and as required by Cal-OSHA.
  - 4) Furnish, erect, and maintain all necessary safeguards for safety and protection of the public. Such safeguards shall include signs, barricades, lighting, fencing, railing, bridging, and flaggers, which conform to the requirements of state and local Codes and Ordinances.
    - a. Provide solid continuous bottom rail such as 2-by-4s or other material of high contrast attached to the base of barricade and fencing systems to direct blind pedestrians through a temporary path-of-travel.
    - b. Provide proper barricades and temporary curb ramps at all closed crosswalks and curb ramps.

- 5) Provide 45-degree-beveled smooth, non-tripping transitions at all path-of travel height changes over 1/4 in.
- C. Potential Hazards: Storing, positioning or use of equipment, tools, materials, scraps, and trash in a manner that could present a hazard to the public or building by its accidental shifting, ignition, fumes, or other hazardous qualities is prohibited.
- D. Remove barriers and enclosures upon completion of the Work, in accordance with applicable regulatory requirements and to the satisfaction of Library.

#### **1.5 TREE AND PLANT PROTECTION**

- A. Root protection: No storage of materials or equipment will be allowed within the Dripline. Whenever possible, excavation shall be on a radial line, diverging from the tree trunk.
- B. Where construction is to be performed in the vicinity of trees and shrubbery, the Work shall be carried on in a manner that will not cause damage. Trees and shrubbery that are to remain, shall be protected from injury or damage resulting from Contractor's operations as indicated in the drawings.

#### **1.6 GENERAL PROTECTION**

- A. Summary:
  - 1) Protect installed Work and provide special protection where specified in individual specification Sections.
  - 2) Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
  - 3) Provide protective coverings at walls, projections, jambs, sills, and soffits of openings as required by the Work.
  - 4) Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
  - 5) 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.
  - 6) Prohibit traffic from landscaped areas.

#### **1.7 ENVIRONMENTAL CONTROLS**

- A. General
  - 1) Contractor shall comply with all rules, regulations, ordinances and statutes that apply to any work performed under Contract Documents including, without limitation, any toxic, water and soil pollution controls and air pollution controls specified in Government Code Section 11017. Contractor shall be responsible for insuring that Contractor's employees, subcontractors and the public are protected from exposure to airborne hazards or contaminated water, soil or other toxic materials used during or generated by activities on the Site or associated with the Project.
- B. Dust Control and Disposal of Surplus Soils
  - 1) Water or other dust palliative shall be sprayed on stockpiles of soil, unpaved construction and staging areas during construction to control dust, as needed, or required by Library's Project Manager.
  - 2) All surplus soils that cannot be used on the Site will be disposed of at an acceptable disposal site at no additional cost to Library. If any areas outside the Site are used for disposal or stockpiling of soil or other materials, Contractor will obtain all the required permits, including, if applicable, a grading permit. Contractor will notify the California Department of Fish and Game of the intent to use the site, and the Sonoma Library Permit and Resource Management Department to determine if a grading permit is required. Contractor will provide evidence to Library's Project Manager that the site does not affect wetlands under the jurisdiction of the Army Corps of Engineers, or that the site has the appropriate permit from the Army Corps of Engineers.
  - 3) Surplus concrete, rubble or pavement will be taken to a permitted concrete and/or asphalt recycling facility.
  - 4) Trucks hauling soil, sand, and other loose materials over public roads will cover the loads, or will keep the loads at least two (2) feet below the level of the sides of the

- container, or will wet the load sufficiently to prevent dust emissions.
- 5) Paved roads and streets will be swept as needed, or required by Library's Project Manager, to remove soil that has been carried onto them from the Site.
- 6) Traffic speeds on unpaved areas shall not exceed fifteen (15) mph, signs to be posted ensuring all drivers in the construction area are aware of this speed limit.
- C. Emergency Access
  - 1) Contractor to maintain emergency vehicle access to existing areas of the site that require access through and/or have been altered due to site work phasing.

## 1.8 TEMPORARY CONTROLS

- A. General:
  - 1) Contractor shall exercise all special controls necessary to control dust, water, and pollution as required by the project conditions, Legal Requirements, or when directed by **Library's Project Manager**. The cost of special controls required shall be included in the Contract Sum and shall not create additional costs to Library.
  - 2) Contractor shall not begin any demolition operations until all temporary dust curtains are in place and approved by **Library's Project Manager**. The dust partitions shall be maintained until after all sanding, painting or other operations which produce dust or fumes are completed. Dust protection will extend from floor to ceiling.
  - 3) Contractor shall assume all the liability for claims related to dust or wind-blown materials attributable to its work. Special dust control measures shall be taken to keep dust from automobiles parked in the vicinity of the construction site.
- B. Dust Control:
  - 1) Perform the Work in a manner to minimize the generation of dust and dirt, to prevent dust and dirt from interfering with the progress of the Work, and to keep dust and dirt from accumulating in Work areas and adjacent areas.
    - a. Water down outdoors Work site at least three times daily or more frequently as required by Library.
    - b. Provide continuous water misting using as fine a spray/mist as possible during earthwork, off-hauling and dirt moving activity.
    - c. Perform wet sweeping/vacuuming of the asphalt surfaces of all residual dirt and debris from immediately adjoining streets used for site access as required at the following minimum frequencies:
      - 1) During the initial mobilization period, once daily in the afternoon
      - 2) During all excavation and dirt moving activities, two times daily and once at the end of the work day
      - 3) After excavation and dirt moving activities until Project Completion, once weekly or more frequently as required by Library
    - d. Wet/vacuum sweeper equipment shall have sufficient suction so as to ensure that while sweeping, dust and dirt is not blown towards neighboring businesses or residences.
    - e. Minimize the amount of excavated or demolished materials at the Work site. Stockpiled excavated material is prohibited at the Work site unless specifically authorized in writing by Library.
    - f. If excavated material is allowed to be stockpiled, cover all such material with 10 mil HDPE plastic at all times.
    - g. Replace ground cover in disturbed areas as soon as possible.
    - h. Enclose, cover, water, or apply soil binders to exposed stockpiles.
    - i. Cover stockpiled imported backfill or other dust-generating soil materials with tarps at all times.
    - j. Limit dust emissions during periods of high winds (greater than fifteen (15) miles per hour). Suspend all excavation and dirt moving activities if winds exceed 25 mph.
    - k. Trucks and trailers used to transport excavated material shall be suitably constructed, covered, and equipped to prevent spillage of loaded materials on public streets and highways.



- l. Hauling trucks carrying excavated material shall be loaded so that the material does not extend above the walls or back of the truck bed. The loaded material shall be wetted and tightly covered before the trucks leave the loading area.
      - m. Vehicle travel speed shall be limited to 15 mph for all vehicles operating within the construction site. Limit equipment speed to ten (10) miles per hour in unpaved areas. Refer to Section 01571 for truck access requirements.
- C. Pollution: Comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of construction and disposal operations.
  - 1) No burning of refuse, debris or other materials shall occur on or in the vicinity of the Project site.
  - 2) Prevent toxic concentrations of chemicals.
  - 3) Provide methods, means and facilities to prevent contamination of soil, water and atmosphere by the discharge of noxious substances from demolition and construction operations.
  - 4) Remove and legally dispose of soil contaminated by the performance of the Work, and replace with good soil at no expense to Library.
  - 5) Provide systems for control of atmospheric pollutants.
  - 6) Prevent harmful dispersal of pollutants into the atmosphere.
  - 7) Maintain and operate construction equipment to minimize exhaust emissions of particulate and other pollutants.
    - a. Ensure that idling time for all heavy equipment is minimized to reduce on-Site emissions. Prohibit idling motors when equipment is not in use or when trucks are waiting in queues.
    - b. Maintain equipment in good mechanical condition. Implement specific maintenance programs to reduce emissions from equipment that would be in frequent use for much of the demolition and construction periods.
- D. Noise and Vibration Control: Conform with night and weekend construction work and general construction noise control requirements of local Codes and Ordinances and as described in the General Conditions / Supplemental Conditions.
  - 1) Noise and Vibration Control
    - a. Contractor shall comply with any and all noise related ordinances and restrictions that apply to the location of the Work.
    - b. Secure written permission from Library Representative at least three (3) working days prior to using noisy and vibratory equipment; such as, jackhammers, concrete saws, impact tools, and high frequency electrical equipment. This type of noisy and vibratory work will not be allowed in occupied buildings between the hours of 7:00 A.M. and 6:00 P.M., Monday through Friday. Refer to Section 01100 (Summary) for further restrictions, if any.
    - c. All internal combustion engines, equipment and impact tools used on the Site shall be operated with exhaust (and intake where applicable) mufflers that meet the requirements of the State Public Resources Code, and, where applicable, the Vehicle Code.
    - d. No equipment used on the Site shall produce noise levels in excess of the following limits in Db(A) at a distance of 50 feet from the equipment under test:
      - 1) Earthmoving Equipment
 

(a) Front loader	-	79
(b) Backhoes	-	85
(c) Dozers	-	80
(d) Tractors	-	80
(e) Scrapers	-	88
(f) Graders	-	85
(g) Truck	-	91
(h) Paver	-	89
      - 2) Materials Handling Equipment
 

(a) Concrete Mixer	-	85
(b) Concrete Pump	-	82

(c) Crane	-	83
(d) Derrick	-	88
3) Stationary Equipment		
(a) Pumps	-	76
(b) Generators	-	78
(c) Compressors	-	81
4) Impact Equipment		
(a) Pile Drivers	-	101
(b) Jack Hammers	-	88
(c) Rock Drills	-	98
(d) Pneumatic Tools	-	86
5) Other Equipment		
(a) Saws	-	78
(b) Vibrators	-	76

2) Idling diesel engines shall be turned off.

E. Water Control:

- 1) In the event that site excavations encounter groundwater that must be removed, Contractor shall obtain a de-watering permit from the North Coast Regional Water Quality Control Board, and shall follow the requirements or conditions of that permit.
- 2) Provide and operate existing dewatering system and pumping equipment. Continue operations and provide all additional dewatering measures as needed to maintain excavations free from standing water.
- 3) Provide proper site drainage to protect excavations and adjoining structures and improvements from damage.
- 4) Pretreat all dewatered groundwater using settling tanks and, as necessary, oil/water separators and other systems as approved by Library and City prior to discharge into City sewer system.
  - a. Contractor shall conform to the requirements for handling groundwater and obtain and pay for all permits required for disposal into City sewer system as described in the General Conditions / Supplemental Conditions.
  - b. Discharge groundwater at locations approved by Library.
  - c. Do not permit surface and subsurface water and other liquids to accumulate in or about the Project site and vicinity thereof.
  - d. Should conditions develop, control water or other liquids, and suitably dispose by means of temporary pumps, piping, drainage lines, troughs, ditches, dams or other methods.

G. Sewerage Control: Take adequate measures to prevent the impairment of the operation of the sewerage system. Prevent all construction material, pavement, concrete, soil, or other debris from entering all sewers, sewer structure, catch basin, or storm water inlet.

**1.9 TEMPORARY STORAGE AND PARKING FACILITIES**

A. Contractor shall confine its apparatus, the storage of materials and operations of its workers to limits indicated by any Legal Requirements and/or directions of Library Project Manager, and shall not unreasonably encumber the premises with its material. Apparatus and equipment used by Contractor during construction shall be placed in such locations as not to interfere with or delay the completion of the Work. Where any portion of the Work is to be finished before other portions of the Work, the portions to be finished shall not be used for the storage of materials, and no construction apparatus shall be installed in such parts of the Work. Hoist and construction appliances shall be installed on the interior of the building to which the Work pertains only when approved by Library Project Manager, and are to be installed on the exterior wherever possible.

B. Storage:

- 1) Provide as required for the performance of the Work.
- 2) Dimensions adequate for storage and handling of products.
- 3) Ventilation to comply with specified and regulatory requirements for products stored.
- 4) Heating adequate to maintain temperatures specified in respective Sections for

products stored.

- 5) Any use of any interior portion of building for storage shall be subject to Library's approval.
  - 6) Location of on-site material storage areas shall be approved by Library prior to storage of materials.
- C. On-site vehicle parking is allowed for Contractor's and subcontractor's employees in areas designated by Library Representative
  - D. Arrange with Library Representative all parking permits needed for work force and deliveries.
  - E. See also Section 01571.

#### **1.11 CONTRACTOR USE OF SITE**

- A. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws.
- B. Do not unreasonably encumber Site with materials or equipment.
- C. Prior to commencement of construction, Contractor and Library shall jointly survey the area adjacent to the Project area making permanent note and record of such existing damage as cracks, sags, or other similar damage. This record shall serve as a basis for determination of subsequent damage to these structures due to Contractor's operations. If possible, damage as noted shall be marked on the structure. All parties making the survey shall sign the official record of existing damage. Cracks, sags, or damage of any nature to the adjacent Project area, not noted in the original survey but subsequently noted, shall be reported immediately to Library.
- D. Employees and visitors shall have unobstructed ingress and egress. Parking facilities shall not be blocked or hindered.
- E. Access to occupied areas: Contractor shall give Library at least seven (7) days written notice prior to requiring access to or work in any/or occupied areas except the immediate unoccupied work area(s) as indicated on the Drawings.
- F. Assume full responsibility for protection and safekeeping of products stored on premises.
- G. Move any stored products that interfere with operations of Library or other contractor.
- H. Coordinate parking, storage, staging, and Work areas with Library.

#### **1.12 AIR QUALITY STANDARDS**

- A. Cover trucks hauling dirt.
- B. Removed earth tracked onto neighboring paved roads at least once daily.

#### **1.13 CONSTRUCTION STAKING AND MONUMENT PROTECTION**

- A. Contractor will provide construction staking to establish horizontal and vertical control for the project that are necessary for Contractor to proceed with the Work.
  - 1) Contractor to refer to Section 1.13 Lines and Grades, Measurements of the Construction Facilities and Temporary Controls for additional information on Construction Staking.
- B. Contractor shall notify Library a least seven (7) days prior to the need for benchmark and initial control staking. Contractor shall be responsible for locating all other necessary controls and all construction staking necessary to properly locate all Work.
  - 1) Illegible survey requests or requests for surveys to Library without proper notification may result in delayed surveys. No extension of Contract Time will be allowed due to such delays.
  - 2) Contractor shall be responsible for protecting and preserve the established property monuments, and shall make no changes or relocations without the prior written approval of Library. Whenever Contractor knows or reasonably should know that any Work activity is likely to damage or destroy any property monuments, or require relocation because of necessary changes in grades or locations, provide at least five (5) Days advance notice to Library. In any event, Contractor shall notify Library whenever any property monuments are lost or destroyed or require relocation because of necessary changes in grads of locations. Library shall replace or repair

property monuments at Contractor's expense.

- C. Contractor shall be responsible for protecting and preserve the established construction stakes.

**1.14 PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND FACILITIES**

- A. The Drawings may indicate existing above- and below-grade structures, drainage lines, storm drains, sewers, water lines, gas lines, electrical lines, hot water lines, and other similar items and Underground Facilities that are known to Library.
  - 1) At least two (2) Business Days, or as otherwise noted, prior to commencement of excavation, notify Library and USA.
- B. Where overhead service to a structure, known to receive service, does not exist, then underground service shall be assumed to exist.
- C. Attention is also directed to the existence of overhead power and telephone lines.
- D. Perform potholing by hand within 24 inches (in any direction) of the Underground Facilities. This may be done on an area-by-area basis, but shall be accomplished at least seven (7) Days in advance of the date of construction within such area.
- E. Power pole: Special attention is directed to the power poles shown on Drawings. Protection of the poles may require assistance from Pacific Gas and Electric Company. Cost for assistance by PG&E shall be borne by Contractor.
- F. No attempt has been made to locate private utilities on private property such as sprinkler irrigation systems or electrical conduits. Contact the property Owners prior to construction.
- G. In addition to reporting, if a utility is damaged, Contractor must take appropriate action as provided in Document 007200 (General Conditions).
- H. Additional compensation or extension of time on account of utilities not indicated or otherwise brought to Contractor's attention including reasonable action taken to protect or repair damage shall be determined as provided in Document 00700 (General Conditions).

**1.15 PERMITS**

- A. Permits, agreements, or written authorizations that are known by Library to apply to this Project are listed below:

END OF SECTION

## SECTION 015400

### SITE SECURITY AND SAFETY

#### PART 1 GENERAL

##### 1.1 SUBMITTALS

- A. See Section 013300 (Submittal Procedures).
- B. Safety Program.
- C. Fire Protection Plan.

##### 1.2 PROTECTION

- A. Continuously maintain protection as necessary to protect the Work, as a whole and in part, and adjacent property and improvements from accidents, injuries or damage.
- B. Properly protect the Work:
  - 1) With lights, guard rails, temporary covers and barricades.
  - 2) Enclose excavations with proper barricades.
  - 3) Brace and secure all parts of the Work against storm and accident.
  - 4) Provide such additional forms of protection that may be necessary under existing circumstances.
- C. Provide and maintain in good condition all protective measures required to adequately protect the public from hazards resulting from the Work and to exclude unauthorized persons from the Work. When regulated by Building Code, Cal OSHA, or other authority, such legal requirements for protection shall be considered as minimum requirements. Be responsible for the protection in excess of such minimum requirements as required.
- D. Related Sections:
  - 1) Section 015000 - Temporary Facilities and Controls
  - 2) Section 015500 – Vehicular Access and Parking

##### 1.3 CONTROL OF SITE

- A. Contractor shall be responsible for securing the project Site (the fence, area within the fence, and the building) to:

- 1) Provide site security to assure that no member of the public is able to gain access to the work area at any time. Contractor shall maintain access and egress routes at all times.
  - 2) Secure, maintain, and protect the building, its contents, the Work, stored materials, equipment and temporary facilities until time of acceptance, or such earlier time as Library may choose to assume such responsibility. Security and protection may be by any legal method, or methods, acceptable to Library.
  - 3) At Contractor's option, provide a night security guard during all hours that Contractor is not physically in control of the site through its performance of the Work.
- B. Ensure that no alcohol, firearms, weapons, or controlled substance enters or is used at the Site. Immediately remove from the Site and terminate the employment of any employee found in violation of this provision.

#### **1.4 SAFETY PROGRAM**

- A. Prior to starting any Work at the Site, submit a Safety Program that has been reviewed and approved by an Industrial Hygienist certified by the American Board of Industrial Hygiene or a Certified Safety Professional. The Safety Program shall include the name, certification number, and certification seal of the Industrial Hygienist or Certified Safety Professional. Comply with the Safety Program and all applicable federal, state, and local regulation codes, rules, law and ordinances.
- B. Receipt and/or review of the Safety Program by Library, Architect, Engineer or Library's Representative shall not relieve Contractor of any responsibility for complying with all applicable safety regulations.
- C. It is essential that Contractor and each Subcontractor implement an effective and vigorous Safety and Health Program to cover their respective portions of the Work. Subject to Contractor's overall responsibility for Project safety, it shall be understood that the full responsibility for providing a safe place to work with respect to their respective portions of the Work rests with each individual Contractor and Subcontractor.
- D. Safety Program components:
  - 1) Injury and Illness Prevention Program (IIPP): Conforming to the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203), and the California Labor Code (Section 6401.7).
  - 2) Site-Specific Safety and Health Plan (SSHP): Describing health and safety procedures that shall be implemented during the Work in order to ensure safety of the public and those performing the Work. Follow the guidelines for a SSHP listed in CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5192, Item (b)(4) f.

- E. The wearing of hard hats shall be mandatory at all times for personnel on Site. Supply sufficient hard hats to equip properly all employees and visitors.
- F. Whenever an exposure exists, appropriate personal protective equipment (PPE) shall be used by all affected personnel. Supply PPE to all personnel under Contractor's direction.
- G. Submit three (3) copies of Safety Program specific to these Contract Documents to Library within the time set forth in Section 01540 (Site Security and Safety), paragraph 1.4.

## **1.5 SAFETY REQUIREMENTS**

- A. Standards: Maintain the Project in accordance with state and local safety and insurance standards.
- B. Hazards Control:
  - 1) Store volatile wastes in covered metal containers and remove from premises daily.
  - 2) Prevent accumulation of wastes that create hazardous conditions.
  - 3) Provide adequate ventilation during use of volatile or noxious substances.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - 1) Do not burn or bury rubbish or waste material on the Site.
  - 2) Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
  - 3) Do not dispose of wastes into streams or waterways.
- D. Provide accident information on the forms provided by Contractor. This information shall be provided on the same Day as the occurrence of said incident.
- E. Coordinate emergency vehicle access route to the site with the City of Petaluma Fire Department. Emergency vehicle access route to be maintained at all times during the project as required by the City of Petaluma Fire Department.

## **1.6 SITE SAFETY OFFICER**

- A. Designate one of Contractor's staff as "Site Safety Officer" whose duties shall include the responsibility for enforcing the environmental protection provisions of the Contract Documents including safety and health, the requirements of the Occupational Safety and Health Act, and other applicable federal, state and local standards. Submit for review by Library Contractor's intended traffic flow plan, security plan, program for temporary structures, housecleaning plan, demolition program, and environmental safety and health plan. After review by Library, the implementation and enforcement of these plans shall become the responsibility of the Site Safety Officer. Any changes in the

plans shall be requested by Contractor through the Site Safety Officer for written concurrence by Library.

- B. Library's risk management representative(s) shall be allowed access to accident/injury and illness reports, inspection reports, scheduling and construction meetings, and safety meetings.

#### **1.7 FIRE PROTECTION PLAN**

- A. Prior to starting any work that includes combustible materials at the Site, submit one (1) copy of a fire protection plan that has been reviewed and approved by the City of Petaluma Fire Department to Library Project Manager. It is recommended that the plan include, but not be limited to, a discussion of the following items:
  - 1) Equipment spark arresters
  - 2) Fire-extinguishing equipment on hand
  - 3) Method of operation in case of fire
  - 4) Notification to authorities of any fire
  - 5) Access available during performance of Work
  - 6) Educating workers of fire protection plan

#### **1.8 SHORING SAFETY PLAN**

- A. Any conflict between this paragraph 1.8 and Division 2 of the Specifications shall be resolved in favor of the most stringent requirement.
- B. At least five Days in advance of any excavation five feet or more in depth, Contractor shall submit to Library a detailed plan showing the shoring, bracing and sloping design (including calculations) and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.
- C. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. Library's acceptance of any drawings showing the shoring or bracing design or Work schedule shall not relieve Contractor of its responsibilities under this paragraph 1.8.



- D. Contractor shall appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system to be used depending on local soil type, water table, stratification, depth, etc.

END OF SECTION

SECTION 015500

**VEHICULAR ACCESS AND PARKING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: This Section sets forth the minimum requirements for traffic routing and traffic control during construction of the Project, if applicable.
- 1) Furnish and install all temporary construction signs, traffic control devices, and pedestrian protection as required by Library for safe and convenient routing of traffic at the Project site.

**1.2 ACCESS REQUIREMENTS**

- A. The following access and egress restrictions will apply:
- 1) Contractor shall not block access to fire hydrants or standpipe connections at any time.
- B. Contractor shall notify Library and appropriate governmental agencies and adjacent property owners a minimum of five (5) working days prior to performing Work which necessitates closing or interfering with traffic on public thoroughfares, parking areas, driveways, and sidewalks.
- 1) Obtain written permission from Library prior to effecting such closures and interruptions.
  - 2) Provide protection for pedestrians as required by Library.

**1.3 TRAFFIC REQUIREMENTS**

- A. General: Contractor shall adequately safeguard the general public and the work by furnishing, installing, and maintaining temporary signs, runway, bridge, guardrails, fences and other facilities as necessary, or required, under the Contract Documents. Contractor shall provide, modify, and maintain proper barriers and enclosures for the protection of vehicular and pedestrian traffic, as required in Section 015000. Such protection measures for traffic specified in Section 015000 shall be incorporated in the Traffic Control Plan. Contractor shall submit traffic routing and safety barricade plans to Library for approval and shall obtain and pay for necessary street use permits for all work not covered in Building (site) Permits. Contractor to submit traffic routing and safety plan to Library for approval prior to trucks accessing the site. Under General Conditions, Contractor shall conduct operations and activities within area shown on Drawings; exceptions may be granted, for special activities, if deemed justified and appropriate as long as mitigation measures are implemented.
- 1) During the construction period, construction truck movement shall be prohibited on weekdays between \_\_\_\_\_ and between \_\_\_\_\_ to minimize peak-hour traffic conflicts.
    - a. Contractor will be responsible for submitting and receiving this approval at the time of submitting general traffic plans to Library Representative for approval.
  - 2) During the \_\_\_\_\_ and \_\_\_\_\_ peak traffic periods, Monday through Friday, Contractor shall conduct his operation in such manner as to leave the full roadway widths normally reserved for "peak hour" traffic on all streets and through intersections, unobstructed and in a condition satisfactory to accommodate vehicular traffic. Exceptions may be granted for special activities if justified and appropriate mitigation measures are implemented.
- B. Special Instruction to Contractor:
- 1) Contractor shall coordinate, schedule and perform work in consideration with property owners in area.
  - 2) Contractor shall submit requests for deviation from the general traffic plan to Library Project Manager three (3) weeks prior to need of special traffic lane requirements. The requests shall be subject to review and approval by Library and any other impacted agencies.
  - 3) Contractor shall pay for costs of temporary signing, striping changes, and other traffic

- engineering related changes.
- 4) Contractor shall provide trained flagmen to control construction traffic where traffic crosses pedestrian movements or as otherwise required and as needed or directed by Library, at no additional cost to Library.
- C. Maintenance of Traffic Signs, Signals and Pedestrian Signal Operation: Existing traffic signals shall be maintained and visible at all times to motorists approaching intersections and to pedestrians using crosswalks.
  - 1) In the event of necessary demolition operations, equipment, materials, or fences may block any traffic signal or sign from view, Contractor shall indicate location and extent of blockage and propose locations for temporary signs or signals.
  - 2) Any required traffic signal shutdown shall require prior approval by Library and other regulatory agencies.
- D. Prohibition of Stopping: Contractor may prohibit stopping in parking lanes where and when necessary as approved under the traffic plan to gain access to Work and to provide required traffic lanes.
  - 1) Contractor shall notify Library of approved prohibition of parking and stopping, at least 72 hours in advance of effective date and time.
  - 2) Contractor shall provide, spaced every 25 feet, signs on type II barricades.
    - a. Contractor shall post required "TOW-AWAY" signs at least 72 hours in advance of effective date and time.
    - b. The effective dates, times, and name of Contractor and telephone number shall be shown on all signs.
  - 3) Contractor shall maintain signs on continual basis and shall replace damaged and missing signs daily.
  - 4) Contractor shall remove signs and mounting materials when construction activities are completed.
- E. Mass Transit Vehicles: Contractor shall not prevent functional operation of mass transit vehicles at any time.
  - 1) Contractor shall become familiar with routes of coach lines that operate within surrounding area of work, and shall post a current copy of such routes in Contractor's on-site office.
  - 2) Lanes made available for traffic shall be located to include an adequate and allowable travel path for coach lines.
  - 3) Contractor's activity shall not preclude provisions of minimum turning radius for mass transit vehicles.
  - 4) Contractor shall notify Library ten (10) working days in advance of doing any work in existing passenger loading zones for buses on each street, where such work could interfere with passenger loading-unloading operations

#### **1.4 SUBMITTALS**

- A. Sequence of Operations and Traffic Routing Plans: Contractor shall submit proposed Sequence of Operations and Traffic Routing Plans to Library for review and approval and shall perform work in accordance with approved plans.
  - 1) Plan shall show:
    - a. Sequence of operations, demolition, and excavation phasing.
    - b. Time required for each phase of Work, including beginning and ending dates.
    - c. Movement, parking and stacking of trucks hauling materials to and from demolition area.
    - d. Any proposed traffic lane closures and transitions.
    - e. Location and layout of traffic cones, signing, and barricades as necessary to provide and maintain the specified number and width of vehicular lanes and pedestrian walkways.
    - f. Location and details of trench protection/construction area using Type II and/or Type III barricades, k-rails, etc.
    - g. Proposed changes (removals, relocation, or temporary installation) of:

- 1) Traffic signals and controllers.
  - 2) Street and safety lighting standards.
  - 3) Traffic signs.
  - 4) Barricades, fence and k-railing.
  - 5) Temporary roadway striping.
  - 6) Flashing arrow signs.
  - 7) Other signs and directional devices.
- 2) Temporary detour signing, striping and temporary traffic signals shall be furnished, installed and maintained by Contractor.
- a. Traffic routing provisions shall not be construed as preventing Contractor from proceeding with mobilization of plant and equipment and placing orders for materials upon receipt of Notice to Proceed, nor shall Contractor be entitled to any delays or compensation due to "DISAPPROVED" Sequence of Operations and Traffic Routing Plans.
  - b. In general, if Sequence of Operations and Traffic Routing Plans comply with intent and specified details of requirements herein specified and with published Library laws and regulations, they will be approved.

## 1.5 QUALITY ASSURANCE

- A. Traffic Coordination and Supervision: In order to assure smooth, continuous flow of pedestrian and vehicular traffic, Contractor shall employ a person, subject to approval by Library, who has had good and sufficient experience in traffic supervision for the type of construction which is called for, in full compliance with all above traffic routing specifications.
- 1) This person shall maintain complete liaison with Library for the purpose of developing and implementing requirements of above traffic routing specifications, and for their supplementation, rearrangement, or reduction.
- B. Traffic Coordination with Other Contractors: Contractor, in order to maintain smooth, continuous flow of traffic, shall coordinate traffic routing work with subcontractors and other contractors, working in the same or adjacent areas, including truck traffic hauling materials and equipment.
- 1) All proposed traffic routing changes shall be subject to approval of Library and shall be considered as revisions to the approved Sequence of Construction and Traffic Routing Plans.
- C. Temporary Construction and Traffic Signs:
- 1) When it becomes necessary to close one or more lanes to vehicular traffic or to otherwise divert such traffic from its normal paths, Contractor shall clearly delineate temporary centerlines separating two-way traffic, and dividing lines for other temporary traffic lanes, by employing cones, barricades, flags, reflectors, and other approved methods or devices as needed.
    - a. Placing of devices shall commence sufficiently in advance of obstruction and cause of diverting traffic to minimize congestion and shall enable traffic to enter, traverse, and leave site of work without abrupt or unwarranted changes in direction.
    - b. Each temporary traffic lane shall not be less than 10 feet clear width unless otherwise specified or approved.
  - 2) High rise warning flag units, each displaying three flags mounted at height of 9 feet, to provide advance warning for traffic approaching the Work, will be required in all cases where motorists' visibility of obstruction or path of movement is limited or obstructed.
  - 3) Temporary signs, lights, barricades, and devices shall be in accordance with California Department of Transportation "Manual of Traffic Controls for Construction and Maintenance Work Zones," dated 1990.
  - 4) Contractor, before starting any Work which could affect normal flow of traffic, shall furnish and install, where and as necessary or directed, and maintain, temporary signs, mounted on barricades or other suitable supports as necessary.
  - 5) Barricades shall be provided and maintained by Contractor along and around all Work in contact with traffic, and shall not be removed until roadway is restored to Library's standards and ready for use.

- 6) Traffic cones shall be at least 20 inches in height, and when used to delineate traffic lanes or separate opposing traffic movements, shall be placed at not greater than 20 foot intervals.
- 7) All signs and equipment shall be installed where and as directed.
  - a. Signs for use at night shall be reflectorized or illuminated.
- 8) Temporary construction and traffic signs, lights, devices, barricades and cones, upon completion of the need therefor, shall be removed from site by Contractor as Contractor's property, unless otherwise specified or needed for protection and security of the Site. See Section 01500.
- 9) Contractor shall, as a minimum, provide at the site and have immediately available, the following signs and equipment.
  - a. Barricades as required by Section 21,400 of the California State Vehicle Code and as specified in the State of California's Department of Transportation "Manual of Traffic Controls for Construction and Maintenance Work Zones", dated 1990, in a sufficient number to safeguard the public and the Work.
  - b. "TOW-AWAY, NO STOPPING" signs as hereinbefore specified.
  - c. Traffic cones to delineate traffic lanes as required to guide and separate traffic movements.
  - d. Number of signs given below are approximate. Actual number of signs to be placed, shall be as indicated on approved Traffic Routing Plans.
    - 1) Four high level warning flag units, placed in advance of traffic approaching the Work, each displaying three flags mounted at a minimum height of 9 feet.
    - 2) Four "ROAD CONSTRUCTION AHEAD" signs, code C18, size 48" x 48", placed in conspicuous locations in advance of the Work, facing approaching traffic, as needed and as approved on the Sequence of Construction and Traffic Routing Plans.
    - 3) Four "SIDEWALK CLOSED, USE OTHER SIDE" signs, size 36" x 18", placed at ends of sidewalks to be closed, as needed and as approved on the Sequence of Construction and Traffic Routing Plans.
    - 4) Two flashing arrow signs, Type II conforming to Section 1203.03 of Caltrans Standard Specifications, dated January 1988, placed as needed and as approved on the Sequence of Construction and Traffic Routing Plans.
    - 5) Two "LEFT/RIGHT LANE CLOSED AHEAD" signs, code C20 (LT/RT), 48" x 48", placed as needed and as approved on the Sequence of Construction and Traffic Routing Plans.
    - 6) Any other signs, placed as needed and as approved on the Sequence of Construction and Traffic Routing Plans.
  - e. Signs and equipment shall conform to requirements of "California Manual on Uniform Traffic Control Devices (MUTCD)" published by the State of California Department of Transportation, dated 1996, including updates; and Library standards.

END OF SECTION

## SECTION 015723

### TEMPORARY STORM WATER POLLUTION CONTROL

#### PART 1 GENERAL

##### 1.1 SUMMARY

A. Section Includes:

- 1) Preventing pollution of storm water run-off from construction site by keeping pollution out of storm drains, reducing exposure and discharge of materials and wastes to storm water, and by reducing erosion and sedimentation. Storm drains discharge run-off to creeks and the Bay without treatment.

B. Related Sections:

- 1) Section 015000 – Temporary Facilities and Controls
- 2) Section 017419 – Construction Waste Management and Disposal
- 3) Section 017300 – Execution

##### 1.2 QUALITY ASSURANCE

- A. For sites of any size or projects involving grading or ground disturbance, the provisions of this section shall apply. In addition to these standards, Contractor shall comply with the Erosion Control Ordinance for the City and/or County where the project is located and with pertinent requirements of other government agencies having jurisdiction over this work.
- B. For sites over one (1) acre in size Contractor shall comply with the State Water Resources Control Board, Order No. 99-08-DWQ, National Pollutant Discharge Elimination System, known as the General Permit (Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity). The Storm Water Pollution Prevention Plan (SWPPP) shall conform to State and Regional Water Quality Control criteria. Contractor shall provide the Storm Water Pollution Prevention Plan within ten (10) working days of the approval of the contract, to Library, at no additional cost. The plan shall include a Water Pollution Control program that clearly shows Water Pollution Control measures that will be implemented in tandem with the construction progress schedule and Water Pollution Control maintenance work. Contractor shall be responsible for penalties assessed or levied on Contractor or Library as a result of

Contractor's failure to comply with the provisions of this section or the requirements of the General Permit and Federal, State and local regulations and all requirements that govern Contractor's operations regarding storm water and non-storm water discharges.

- C. Contractor shall allow ten (10) working days for Library to review the Storm Water Pollution Prevention Plan. If revisions are required, as determined by Library, Contractor shall submit a revised plan within ten (10) days. No Clearing and Grubbing work shall be allowed until the SWPPP has been approved by Library.
- D. The Storm Water Pollution Prevention Plan shall include a Water Pollution Control Plan that graphically indicates where Water Pollution Control measures and temporary erosion control work will be used year round and during all phases of construction. Updated and revised plans shall be submitted no later than August 1 of any year and shall be updated, revised and submitted by the first day of each month thereafter until and including March 31 of the following year. From April 1 to July 31, updates, revisions and number of submittals will be determined by Library. The updated plan shall indicate any new construction work and the addition of any new temporary erosion control or slope protection facilities added or upgraded to accommodate the new earthwork.
- E. The Storm Water Pollution Prevention Plan and Water Pollution Control Program shall be updated and revised whenever there is a proposed change in construction or operations which may affect the site drainage patterns or discharge of pollutants to surface waters, groundwaters, or a separate municipal storm sewer system. The change will be recorded by amending (updating) the SWPPP in accordance with the provisions of SWPPP amendment which includes revisions to the Water Pollution Control program and graphic changes to the Water Pollution Control Plan.
- F. The Storm Water Pollution Prevention Plan shall include a site map which shall be a combination of the contract drainage, stage construction, and contour grading plans shown at either full or reduced size. Geometric equations, notes, details and all data non-related to Water Pollution Control work shall be removed to improve clarity. A copy of the contract plans shall be used as a base sheet with the pertinent stage of construction drawn in as an overlay. The intent of this combination of plans is to accurately show site conditions at various phases of construction.
- G. A copy of the Storm Water Pollution Prevention Plan, together with updates, revisions and amendments shall be kept at the construction site. At the request of Library, Contractor shall furnish up to five (5) copies of the SWPPP for distribution.

### **1.3 GENERAL REQUIREMENTS**

- A. Comply with Section 01505 – Construction Waste Management.
- B. The following general requirements shall be met on all projects.

- 1) Non-hazardous Material/Waste Management
  - a. Designated Area: Propose designated areas of the project site, for approval by Library Representative, suitable for material delivery, storage, and waste collection that, to the maximum extent practicable, are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.
  - b. Granular Material:
    - 1) Store granular material at least ten feet away from basin and curb returns.
    - 2) Do not allow granular material to enter the storm drains or creeks.
    - 3) When rain is forecast within 24 hours or during wet weather, Library Representative may require Contractor to cover granular material with sandbags.
  - c. Dust Control: Use reclaimed water to control dust on a daily basis or as required by Library Representative.
  - d. Cleaning Paved Storage Areas: Thoroughly clean all on-site paved areas used for storage of materials or otherwise utilized or involved during the work immediately after the materials are removed from storage. Cleaning shall be accomplished by sweeping and not with use of water.
  - e. Recycling:
    - 1) To the extent practicable, recycle aggregate base material, asphalt concrete, and Portland cement concrete as described in these Specifications.
    - 2) In addition, to the maximum extent practicable, reuse or recycle any useful construction materials generated during the project.
  - f. Disposal:
    - 1) Maintain the project site in a clean and orderly manner at all times. To the extent practicable, Contractor shall collect scrap, debris, and waste material, and dispose of such materials properly. Library Representative may require Contractor to clean and dispose of such materials at any time should the situation, in his/her opinion, constitute a danger.
    - 2) Inspect dumpsters for leaks and contact trash hauling contractors to replace or repair dumpsters that leak.
    - 3) Do not discharge water on-site from cleaning dumpsters.
    - 4) Arrange waste collection before dumpsters overflow.



## 2) Hazardous Material/Waste Management

### a. Storage:

- 1) Label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels; and all hazardous wastes, such as waste oil and antifreeze; in accordance with the City of Petaluma or Sonoma County Hazardous Materials Storage Ordinance (as applicable), and all applicable State and Federal regulations.
- 2) Store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations, and it is recommended that these materials and waste be covered, as needed, to avoid potential management of collected rainwater as a hazardous waste.
- 3) Keep an accurate, up-to-date inventory, including Material Safety Data Sheets (MSDS), of hazardous materials and hazardous wastes stored on-site, to assist emergency response personnel in the event of a hazardous materials incident.

### b. Usage:

- 1) When rain is forecast within 24 hours or during wet weather, Library Representative may inform Contractor cannot apply chemicals in outside areas.
- 2) Do not over apply pesticides or fertilizers and shall follow material manufacturers instructions regarding uses, protective equipment ventilation, flammability, and mixing of chemicals. Over-application of a pesticide constitutes a "label violation" subject to an enforcement action by the Sonoma County Agriculture Department.

### c. Disposal:

- 1) Arrange for regular hazardous waste collection to comply with time limits on storage of hazardous waste.
- 2) Dispose of hazardous waste only at authorized and permitted Treatment, Storage, and Disposal Facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal regulations.

## 3) Spill Prevention and Control:

- a. Keep a stockpile of spill cleanup materials, such as rags, or absorbents, readily accessible on-site.
  - b. Immediately contain and prevent leaks and spills from entering storm drains, and properly clean up and dispose of the waste and clean up materials. If the waste is hazardous, Contractor shall handle the waste as described in Section A.2.c above.
  - c. Do not wash any spilled material into streets, gutters, storm drains, or creek and shall not bury spilled hazardous materials.
  - d. Report any hazardous materials spill to the City of Petaluma or Sonoma County Department of Environmental Health (as applicable), and to Library's Representative.
- 4) Vehicle/Equipment Cleaning:
- a. Do not perform vehicle or equipment cleaning on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods.
  - b. Perform vehicle or equipment cleaning, with water only, in a designated, beamed area that will not allow rinse water to run off-site or into streets, gutters, storm drains, or creeks.
- 5) Vehicle/Equipment Maintenance and Fueling:
- a. Do not perform maintenance and fueling of vehicles or equipment in a designated, beamed area a drip pan will not allow run-on of storm water or run-off spills.
  - b. Use secondary containment such as a drip pan to catch leaks or soils and time that vehicle or equipment fluids are dispensed, changed, or poured.
  - c. Keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site.
  - d. Clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described in Section A.2.c above.
  - e. Do not wash any spilled material into streets, gutters, storm drains, or creeks and shall not bury spilled hazardous materials.
  - f. Report any hazardous materials spill to the City of Petaluma or Sonoma County Department of Environmental Health (as applicable), and Library's Representative.

- g. Inspect vehicle and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repair is made.
  - h. Recycle waste oil and antifreeze, to the maximum extent practicable.
  - i. Comply with Federal, State, County and City requirements for above ground storage tanks.
- 6) Contractors Training and Awareness:
- a. Train all employees/subcontractors on the storm water pollution prevention requirements contained in these Specifications.
  - b. Inform subcontractors of the storm water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.
  - c. Post warning signs in areas treated with chemicals.
  - d. Paint new catch basins, constricted as part of the project with a “No Dumping” stencil.

#### **1.4 ACTIVITY–SPECIFIC REQUIREMENTS**

A. The following activity-specific requirements shall be met on all projects which include the listed activities.

- 1) Paving Operations:
  - a. Project Site Management:
    - 1) When rain is forecast within 24 hours or during wet weather, Library Representative may prevent Contractor from paving or placing concrete.
    - 2) Library Representative may require Contractor to protect drainage courses by using control measure, such as filter fabric, waddles, and sand bags, to divert runoff or trap and filter sediment.
    - 3) Cover drip pans or absorbent material under paving equipment when not in use.
    - 4) Cover catch basins and manholes when paving or applying seat coat, tack coat, slurry seal, or fog seal.
    - 5) If the paving operation includes an on-site mixing plant, Contractor shall comply with Sonoma County General Industrial Activities Storm Water Permit requirements.

- b. Paving Waste Management: Do not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. Instead, either collect the sand or return it to the stockpile, or dispose of it in a trash container. Do not use water to wash down fresh asphalt concrete pavement.
- 2) Saw Cutting:
- a. During saw cutting, cover or barricade catch basins using control measures, such as filter fabric, waddles, sand bags, and fine gravel dams, to keep slurry out of the catch basin.
  - b. Sanitary and Storm Drain Systems: When protecting a catch basin, ensure that the entire opening is covered.
  - c. Shovel, absorb, or vacuum saw cut slurry and pick up the waste before moving to the next location or at the end of each working day, whichever is sooner.
  - d. If saw cut slurry enters catch basins, remove the slurry from the storm drain system immediately.
- 3) Contaminated Soil Management:
- a. On all projects involving grading or excavation, look for contaminated soil as evidenced by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris. If the project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil shall only be required if directed by Library Representative. Follow Section 007200 if contamination is found.
  - b. If the project is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested. The soil shall be managed as required by the following agency: Sonoma County Department of Environmental Health.
  - c. If the project is found to be within an area of soil contamination not identified by Library in the project specifications, a change order shall be negotiated to cover additional work performed by Contractor.
- 4) Concrete, Grout and Mortar Waste Management:
- a. Material Management: Concrete, grout and mortar; store and keep covered away from drainage areas and ensure that these materials do not enter the storm drain system.
  - b. Concrete Truck/Equipment Wash Out:

- 1) Do not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks.
  - 2) Perform wash out of concrete trucks or equipment off-site or in designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. Let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, then collect the wash water and remove it off-site.
- c. Exposed Aggregate Concrete Wash Water:
- 1) Avoid creating runoff by draining water from washing of exposed aggregate concrete to a dirt area. If a suitable dirt area is not available, then Contractor shall filter the wash water through straw bales or equivalent material before discharging to the storm drain.
  - 2) Collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in a trash container.
- 5) Painting:
- a. Painting Cleanup:
    - 1) Designated Area:
      - (a) Conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or run-off of spills.
      - (b) Contractor shall not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drains, or creeks.
    - 2) Water-based Paint:
      - (a) Contractor shall remove as much excess paint as possible from brushes, rollers, and equipment before starting cleanup.
      - (b) To the maximum extent practicable, Contractor shall dispose of wash water from aqueous cleaning of equipment and tools to the sanitary sewer.
      - (c) Otherwise, Contractor shall direct wash water onto dirt area and spade in.
    - 3) Oil-based Paint:
      - (a) Contractor shall remove as much excess paint as possible from brushes, rollers and equipment before starting cleanup.

- (b) To the maximum extent practicable, Contractor shall filter paint thinner and solvents for reuse.
  - (c) Contractor shall dispose of waste thinner and solvent, and sludge from cleaning of equipment and tools as hazardous waste, as described in Section A.2.c above.
- 6) Material/Waste Management:
  - a. Store paint, solvents, chemicals, and waste materials in compliance with the Sonoma County Hazardous Materials Storage Ordinances and all applicable State and Federal regulations. Store these materials in a designated area that will not allow run-on of storm water or run-off of spills.
  - b. Dispose of excess thinners, solvents, oil and water based paint as hazardous waste.
  - c. Dispose of dry, empty paint cans, buckets, old brushes, rollers, rags, and drop cloths in the trash.
- 7) Earthwork: Maximize the control of erosion and sediment by using the BMP's for erosion and sedimentation in the *California Storm Water Best Management Practice Handbook-Construction Activity*.

END OF SECTION

**SECTION 015800**

**PROJECT IDENTIFICATION**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1) Project identification sign
  - 2) Project informational signs
  - 3) Maintenance
  - 4) Removal
- B. Related Sections
  - 1) Section 011000: Summary

**1.2 QUALITY ASSURANCE**

- A. Design sign and structure to withstand 50 miles/hr wind.
- B. Sign Painter: Experienced as a professional sign painter for a minimum of five years.
- C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

**1.3 SUBMITTALS**

- A. Section 013300 Submittal Procedures, shop drawings and product data.
- B. Show content, layout, lettering, color, structure, sizes, and proposed locations for signs.

**PART 2 PRODUCTS**

**1.1 2.1 SIGN MATERIALS**

- A. A. Structure and Framing: New, wood, structurally adequate.
- B. B. Sign Surface: Exterior grade plywood with medium density overlay, minimum 3/4 - inch thick, standard large sizes to minimize joints.
- C. C. Rough Hardware: Galvanized.
- D. D. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
- E. E. Lettering: Exterior quality paint, contrasting colors as selected.

**1.2 2.2 PROJECT IDENTIFICATION SIGN**

- A. A. One painted sign, 48 sq. feet, bottom 6 feet above ground.
- B. B. Content:
  - 1) Project title and name of Library as indicated on Contract Documents
  - 2) Names and titles of authorities
  - 3) Names and titles of Architect and Consultants
  - 4) Name of Prime Contractor
- C. C. Graphic Design, Colors, Style of Lettering: Designated by **Library's Project Manager**.
- D. D. Layout:

PETALUMA REGIONAL LIBRARY RENOVATION

SONOMA COUNTY LIBRARY

ARCHITECT: [ARCHITECT] \_\_\_\_\_  
CIVIL ENGINEER [ENGINEER] \_\_\_\_\_  
STRUCTURAL ENGINEER: [ENGINEER]. \_\_\_\_\_  
MECHANICAL/ELECTRICAL ENGINEER: [ENGINEER] \_\_\_\_\_

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GENERAL CONTRACTOR

**1.3 2.3 BRASS PLAQUE**

- A. A. Contractor shall provide in its bid a brass plaque and its installation on building exterior, exact location to be determined by Library when shop drawing is submitted for review.
- B. B. Plaque shall be solid brass. Anchor studs shall be concealed on back of plaque.
  - 1) Sizes:  $\frac{3}{4}$ " thick x 24" square with  $\frac{1}{2}$ " radius corners.
  - 2) Plaque and raised letters shall be polished brass.
  - 3) Flat black etched background.
  - 4) Size and type face to be determined with submittal.
- C. C. Layout: to be provided by Library

**PART 3 EXECUTION**

**1.4 3.1 INSTALLATION**

- A. Install project identification sign within thirty (30) days after date of Notice to Proceed.
- B. Erect Project sign on Site. Final location is to be reviewed with Library before installation.
- C. Erect supports and framing securely and rigidly braced and framed to resist wind loading.
- D. Paint exposed surfaces of sign supports and framing.

**1.5 3.2 MAINTENANCE**

- A. Maintain sign and supports; keep clean repair deterioration and damage.

**1.1 3.3 REMOVAL**

- A. Remove temporary sign, framing, supports and foundations at completion of Project and restore area.

END OF SECTION



## SECTION 016000

### PRODUCT REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Products
- B. Product Options and Substitutions
- C. Product Delivery Requirements
- D. Product Storage and Handling

##### 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 required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. For similar components, provide interchangeable components of the same manufacturer.

##### 1.3 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Summary:
  - 1) This paragraph 1.3 describes procedures for selecting products and requesting substitutions of unlisted materials in lieu of materials named in the Specifications or approved for use in Addenda that were not already the subject of a Document 002600 (Procurement Substitution Request Form) submittal as provided in Document 002113 (Instructions to Bidders).
- B. Contractor's Options:
  - 1) For products specified only by reference standard: Select any product meeting that standard.
  - 2) For products specified by naming one or more products or manufacturers:
    - a. Select products of any named manufacturer meeting Specifications.

- b. If product becomes unavailable due to no fault of Contractor, submit Request for Substitution (RFS), including all information contained in this Section 01600 and a fully executed Document 002600 (Procurement Substitution Request Form), but using the term "Contractor" each place the term "Bidder" appears in that form.

C. Substitutions:

- 1) Except as provided in Document 002113 (Instructions to Bidders) with respect to "or Approved Equal" items, Library will consider Contractor's substitution requests only when product becomes unavailable due to no fault of Contractor or if the product specified no longer complies with local regulations or laws. Requests for review of proposed substitute items will not be accepted from anyone other than Contractor. The RFS shall state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of Substantial Completion on time, and whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Library for work on the Project).
- 2) Submit separate RFS (and four (4) copies) for each product and support each request with:
  - a. Product identification
  - b. Manufacturer's literature
  - c. Samples, as applicable
  - d. Name and address of similar projects on which product has been used, and dates of installation
  - e. Name, address, and telephone number of manufacturer's representative or sales engineer
  - f. For construction methods: Detailed description of proposed method; drawings illustrating methods
- 3) Where required, itemize a comparison of the proposed substitution with product specified and list significant variations including, but not limited to dimensions, weights, service requirements, and functional differences. If variation from product specified is not pointed out in submittal, variation will be rejected even though submittal was favorably reviewed. Identify all variations of the proposed substitute from that specified in the RFS and indicate available maintenance, repair, and replacement service.
- 4) State whether the substitute will require a change in any of the Contract Documents (or provisions of any other direct contract with Library for work on the Project) to adapt the design of the proposed substitute, and whether or not incorporation or

use of the substitute in connection with Work is subject to payment of any license fee or royalty. Submit data relating to changes in construction schedule.

- 5) Include accurate cost data comparing proposed substitution with product and amount of net change in Contract Sum including, but not limited to, an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by Library in evaluating the proposed substitute. Library may require Contractor to furnish additional data about the proposed substitute.
  - 6) Library will not consider substitutions for acceptance (or, in Library's sole discretion, Library may make Contractor solely responsible for all resulting costs, expenses and other consequences) when a substitution:
    - a. Results in delay meeting construction Milestones or completion dates
    - b. Is indicated or implied on submittals without formal request from Contractor
    - c. Is requested directly by Subcontractor or supplier
    - d. Acceptance will require substantial revision of Contract Documents
    - e. Disrupts Contractor's job rhythm or ability to perform efficiently
  - 7) Substitute products shall not be ordered without written acceptance of Library.
  - 8) Library will determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.
  - 9) All Contract Document requirements apply to Work involving substitutions.
- D. Contractor's Representation and Warranty:
- 1) Contractor's RFS constitutes a representation and warranty that Contractor:
    - a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
    - b. Will provide the same warranty for substitution as for specified product.
    - c. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
    - d. Waives claims for additional costs which may subsequently become apparent.
    - e. Will compensate Library for additional redesign costs associated with substitution.
    - f. Will be responsible for Construction Schedule slippage due to substitution.

- g. Will be responsible for Construction Schedule delay due to late ordering of available specified products caused by requests for substitution that are subsequently rejected by Library.
    - h. Will compensate Library for all costs; including extra costs of performing Work under Contract Documents, extra cost to other contractors, and any claims brought against Library, caused by late requests for substitutions or late ordering of products.
- E. Library's Duties:
  - 1) Review Contractor's RFS with reasonable promptness.
  - 2) Notify Contractor in writing of decision to accept or reject requested substitution.
- F. Administrative Requirements:
  - 1) Specified products, materials, or systems for Project may include engineering or on-file standards required by the regulatory agency. Contractor's substitution of products, materials or systems may require additional engineering, testing, reviews, approvals, assurances, or other information for compliance with regulatory agency requirements or both. Provide all agency approvals or other additional information required and pay additional costs for required Library services made necessary by the substitution at no increase in Contract Sum or Contract Time, and as a part of substitution proposal.

#### **1.4 PRODUCT DELIVERY REQUIREMENTS**

- A. Deliver products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

#### **1.5 PRODUCT STORAGE AND HANDLING**

- A. Store products only in staging area per provisions of Section 011000 (Summary).
- B. Handle, store, and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.
- C. For exterior storage of fabricated products, place on appropriate supports, above ground.
- 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.

- 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.

END OF SECTION

SECTION 017123

**FIELD ENGINEERING**

**PART 1 – GENERAL**

**1.1 SECTION INCLUDES**

- A. Section Includes: Field engineering for the Work.
  - 1) Layout and install all Work to lines and grades in accordance with Contract Documents.
  - 2) Employ a civil engineer or land surveyor to establish building lines and elevations, check structural framework, and establish on the structural frame the required basic grid lines from which the Work shall be laid out.
- B. Related Sections:
  - 1) Section 017839 – Project Record Documents: Documentation of Project layout and site conditions.

**1.2 QUALIFICATIONS OF SURVEYOR OR ENGINEER**

- A. Surveyor or civil engineers shall be licensed in the State of California.

**1.3 SURVEY REFERENCE POINTS**

- A. Basic horizontal and vertical control points for the Project will be furnished by Library.
- B. Locate and protect control points prior to beginning Work; preserve all permanent reference points throughout construction operations.
  - 1) Do not change reference points without prior written notice to Library.
  - 2) Report to Library when any reference point has been lost, destroyed, or requires relocation because of necessary changes in grades or locations.
  - 3) Require engineer or surveyor to replace control points which may be lost or destroyed; base replacements on original survey control.

**1.4 PROJECT SURVEY REQUIREMENTS**

- A. Establish lines and levels, locate, and lay out:
  - 1) Site improvements:
    - a. Stakes for grading and fill placement.
    - b. Utility slopes and invert elevations.
    - c. Driveways and parking lots.
  - 2) Batter boards for structures.
  - 3) Building foundations, column locations, and floor levels.
- B. Verify layouts as Work proceeds to assure compliance with required lines, levels, and tolerances.

**1.5 RECORDS**

- A. Maintain a complete, accurate log of all control and survey work as it progresses. Record deviations from required lines and levels, and advise Library when deviations are detected that exceed indicated or recognized tolerances. Record deviations that are accepted and not corrected on the Project record drawings.
- B. On completion of foundation walls and major site improvements, prepare a certified survey drawing showing all dimensions, locations, angles, and elevations of construction.

**1.6 SUBMITTALS**

- A. Submit to Library certificate signed by the engineer or surveyor certifying that elevations and locations of improvements are in accordance with Contract Documents.
- B. Submit the certified survey drawing on a reproducible Mylar with two prints to Library for incorporation into the Record Drawing sets.

END OF SECTION

SECTION 017300  
EXECUTION

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**2.1 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1) Construction layout.
  - 2) Field engineering and surveying.
  - 3) Installation of the Work.
  - 4) Cutting and patching.
  - 5) Coordination of Owner-installed products.
  - 6) Progress cleaning.
  - 7) Starting and adjusting.
  - 8) Protection of installed construction.
- B. Related Requirements:
  - 1) Section 011000 "Summary" for limits on use of Project site.
  - 2) Section 013300 "Submittal Procedures" for submitting surveys.
  - 3) Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 4) Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
  - 5) Section 078413 "Penetration Fire stopping" for patching penetrations in fire-rated construction.

**3.1 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

**4.1 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For **[professional engineer]**.
- B. Certificates: Submit certificate signed by **[professional engineer]** certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least **<Insert number>** days prior to the time cutting and patching will be performed. Include the following information:
  - 1) Extent: Describe reason for and extent of each occurrence of cutting and patching.
  - 2) Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  - 3) Products: List products to be used for patching and firms or entities that will perform patching work.
  - 4) Dates: Indicate when cutting and patching will be performed.
  - 5) Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

- a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit **<Insert number>** copies signed by **[land surveyor]** **[professional engineer]**.
- F. Final Property Survey: Submit **<Insert number>** copies showing the Work performed and record survey data.

## 5.1 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  - 1) Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
    - a. **<Insert list of structural elements>**.
  - 2) Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. **[ Operational elements include the following:]**
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. Operating systems of special construction.
    - l. **<Insert operating system>**.
  - 3) Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. **[ Other construction elements include but are not limited to the following:]**
    - a. Water, moisture, or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior curtain-wall construction.
    - d. Sprayed fire-resistive material.
    - e. Equipment supports.
    - f. Piping, ductwork, vessels, and equipment.
    - g. Noise- and vibration-control elements and systems.
    - h. **<Insert miscellaneous element>**.



- 4) Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
  - 1) For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Section 018113.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations," Section 018113.16 "Sustainable Design Requirements - LEED for Commercial Interiors," Section 018113.19 "Sustainable Design Requirements - LEED for Core and Shell Development," and Section 018113.23 "Sustainable Design Requirements - LEED for Schools."
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1) If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, **[mechanical and electrical systems]**, and other construction affecting the Work.
  - 1) Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  - 2) Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1) Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2) Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3) Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1) Description of the Work.

- 2) List of detrimental conditions, including substrates.
  - 3) List of unacceptable installation tolerances.
  - 4) Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to **[local utility]** and Library that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a **[land surveyor]** **[professional engineer]** to lay out the Work using accepted surveying practices.
  - 1) Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2) Establish limits on use of Project site.
  - 3) Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 4) Inform installers of lines and levels to which they must comply.
  - 5) Check the location, level and plumb, of every major element as the Work progresses.
  - 6) Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  - 7) Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- A. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- B. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

### 3.4 FIELD ENGINEERING

- A. Identification: Library will identify existing benchmarks, control points, and property corners.

- 1) Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 2) Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
  - 3) Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of **<Insert number>** permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
- 1) Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  - 2) Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  - 3) Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- A. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
- B. Final Property Survey: Engage a **[land surveyor] [professional engineer]** to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by **[land surveyor] [professional engineer]**, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
- 1) Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
  - 2) Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
- 1) Make vertical work plumb and make horizontal work level.
  - 2) Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3) Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4) Maintain minimum headroom clearance of **<Insert dimension>** in occupied spaces and **<Insert dimension>** in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and

aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

- 1) Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2) Allow for building movement, including thermal expansion and contraction.
  - 3) Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### **3.6 CUTTING AND PATCHING**

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- 1) Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to [minimize] [prevent] interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
- 1) In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2) Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3) [Concrete] [and] [Masonry]: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4) Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  - 5) Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6) Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
- 1) Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

- 2) Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  - a) Clean piping, conduit, and similar features before applying paint or other finishing materials.
  - b) Restore damaged pipe covering to its original condition.
- 3) Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - a) Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
- 4) Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- 5) Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### **3.7 OWNER-INSTALLED PRODUCTS**

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
  - 1) Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2) Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

### **3.8 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1) Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2) Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3) Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a) Use containers intended for holding waste materials of type to be stored.
  - 4) Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1) Remove liquid spills promptly.
  - 2) Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning

materials that are not hazardous to health or property and that will not damage exposed surfaces.

- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in **[Section 015000 "Temporary Facilities and Controls."]** **[Section 017419 "Construction Waste Management and Disposal."]**
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.9 STARTING AND ADJUSTING**

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

### **3.10 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION**

## **SECTION 01 73 29 - CUTTING, PATCHING AND ALTERATION PROCEDURES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work., except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Cutting and patching.
- D. Cleaning and protection.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- C. Section 02 41 13 - Selective Demolition: Demolition of portions of existing building as indicated.

#### **1.03 REFERENCE STANDARDS**

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

#### **1.04 SUBMITTALS**

- A. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.
  - 6. Include in request:
    - a. Identification of Project.
    - b. Location and description of affected work.

- c. Necessity for cutting or alteration.
- d. Description of proposed work and products to be used.
- e. Effect on work of Owner or separate Contractor.
- f. Written permission of affected separate Contractor.
- g. Date and time work will be executed.

### **1.05 PROJECT CONDITIONS**

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
  - 1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

### **1.06 COORDINATION**

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- C. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- D. Coordinate completion and clean-up of work of separate sections.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.



## **PART 2 PRODUCTS**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of 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. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.02 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.

### **3.03 GENERAL INSTALLATION REQUIREMENTS**

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

### **3.04 ALTERATIONS**

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
  - 1. Verify that construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
  - 1. Provide, erect, and maintain temporary dustproof partitions.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- D. Remove existing work as indicated and as required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
  - 2. Remove items indicated on drawings.
  - 3. Relocate items indicated on drawings.
  - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
  - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
  - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow

- access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
  3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
    - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
    - b. Provide temporary connections as required to maintain existing systems in service.
  4. Verify that abandoned services serve only abandoned facilities.
  5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
  2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
  3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
  2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
  3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
  4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished,

patch so that the substrate is ready for the new finish.

- I. Refinish existing surfaces as indicated:
  1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
  2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

### **3.05 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
  1. Complete the work.
  2. Fit products together to integrate with other work.
  3. Provide openings for penetration of mechanical, electrical, and other services.
  4. Match work that has been cut to adjacent work.
  5. Repair areas adjacent to cuts to required condition.
  6. Repair new work damaged by subsequent work.
  7. Remove samples of installed work for testing when requested.
  8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.
- J. Patching:
  - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
  - 2. Match color, texture, and appearance.
  - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

### **3.06 PROGRESS CLEANING**

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

### **3.07 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. 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.

- H. Prohibit traffic from landscaped areas.
- I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

**END OF SECTION**

## SECTION 017419

### CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes: Administrative and procedural requirements for diversion of construction and demolition debris from landfill, including salvaging, recycling, and disposing of nonhazardous demolition and construction waste.
- 1) Contractor shall minimize factors that contribute to waste, such as over-packaging, improper storage, ordering error, poor planning, breakage, mishandling, and contamination.
  - 2) Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.

##### **1.2 REFERENCES**

- A. Sonoma County Waste Management Agency: Contact the Sonoma County Eco-Desk at 707-565-3375 or [www.recyclenow.org](http://www.recyclenow.org) for copies of the following:
- 1) Builder's Guide to Re-Use and Recycling.
  - 2) Sonoma Library Recycling Guide, Latest Edition.

##### **1.3 DEFINITIONS**

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, or renovation operations. Construction waste includes packaging. Land clearing debris including soil, vegetation, and rocks are not to be included.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Divert: To use material for any purpose other than disposal in a landfill.
- D. Salvage: Recovery of demolition or construction waste for subsequent incorporation into the Work or for turnover to the Library.

##### **1.4 PERFORMANCE REQUIREMENTS**

- A. Diversion/Recycling Goals: The Library requires at least 75% of all demolition and construction waste be diverted from landfill.
- 1) Demolition Waste:
    - a. Asphaltic concrete paving
    - b. Concrete
    - c. Concrete reinforcing steel
    - d. Concrete masonry units
    - e. Brick and ceramic tile
    - f. Wood framing lumber including studs, joists, posts, beams and girders
    - g. Plywood, oriented strand board, and wood paneling
    - h. Metals, including galvanized and painted steel, stainless steel, iron, aluminum, copper, zinc, lead, brass, bronze, bolts, hangers, anchors, and metal used in suspended ceilings
    - i. Sheet metal including metal studs, lightgauge metal framing, flashings, counterflashings, gutters, downspouts, and other sheet metal fabrications
    - j. Wood doors, hollow metal doors and hollow metal frames
    - k. Door hardware
    - l. Aluminum windows and storefront framing
    - m. Acoustical ceiling panels and tiles
    - n. Carpet and carpet pad
    - o. Plumbing items including metal pipe, valves, sprinklers, supports and hangers
    - p. Porcelain and cast iron toilets and sinks
    - q. Mechanical items including equipment, ductwork, supports and hangers
    - r. Refrigerant from HVAC units and compressors
    - s. Electrical items including conduit, copper wiring, boxes, lighting fixtures, switchgear, and panelboards

- t. Plastic film including shrink wrap and bags, stretch wrap, construction films and lumber wrap
- u. Clean dry unpainted drywall, gypsum, sheetrock
- 2) New Construction Waste:
  - a. Asphaltic concrete
  - b. Portland cement concrete and cement plaster
  - c. Concrete unit masonry, mortar, and grout
  - d. Wood products, including clean dimensional wood, palette wood, plywood, OSB, and particle board
  - e. Metals, including galvanized and primed steel, stainless steel, iron, aluminum, copper, zinc, lead, brass, and bronze. Uses include, but are not limited to miscellaneous metals, rebar, piping, conduit, hangers, supports, fasteners, etc.
  - f. Sheet metals including galvanized steel, stainless steel, aluminum, and copper. Uses include, but are not limited to ductwork, flashings, counterflashings, gutters, downspouts, hangers, supports, banding, etc.
  - g. Roofing
  - h. Packaging, including paper, cardboard, boxes, wood crates and pallets, metal banding, polystyrene packaging, and bubble wrap
  - i. Plastic film including shrink wrap and bags, stretch wrap, construction films and lumber wrap
  - j. Clean dry unpainted drywall, gypsum, sheetrock

## 1.5 SUBMITTALS

- A. Waste Reduction Submittals:
  - 1) Records of Donations and Sales: Indicate receipt and acceptance for salvageable waste donated or sold to individuals and organizations. Indicate whether organization is tax exempt.
  - 2) Recycling Facility Records: Indicate receipt and acceptance of salvageable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  - 3) Landfill Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices
  - 4) Maintain log of each load, of each category item diverted from landfill. Log in separately debris sent to a Class III landfill and materials sent to recycling facilities (See example in this Section).
    - a. Include in log the type of load, load weight, name of hauling service, recycling service or landfill, and date accepted by recycling service or by landfill.
    - b. Library reserves the right to audit the log at any time; retain and make available all weight tickets, copies of receipts, and invoices.
    - c. Units of Measure: Calculate quantities and convert volume measurements to weights in accordance with the Conversion Rates Table in this Section.

## 1.6 QUALITY ASSURANCE

- A. Recycling Company Qualifications: Recycling companies shall meet any of the following:
  - 1) Recycling service provider contracted by Sonoma County to provide recycling services at the County landfill disposal site.
  - 2) Any recycling service that will certify in writing that accepted waste will be diverted from landfill, not dumped illegally, or dumped at sea.
- B. Waste Management Meetings: Include Construction Waste Management on the agenda of meetings. Meetings shall include all subcontractors affected by the Diversion/Recycling Goals. At a minimum, discuss waste management goals and issues at the preconstruction meeting and at periodic jobsite meetings.
  - 1) Review requirements for documenting quantities of each type of waste and its disposition.
  - 2) Review procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 3) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 4) Review waste management requirements for each trade.



## **PART 2 PRODUCTS**

### **2.1 SALVAGE MATERIALS**

- A. General:
  - 1) Clean salvaged items. Pack or crate items after cleaning. Identify contents of containers.
  - 2) Store items in a secure area until delivery to Library or until re-installation.
  - 3) Protect items from damage during transport and storage.
- B. Salvaged Items for Library's Use: transport items to Library's storage area designated by Library's Representative. Salvage the following items for turnover to Library:
  - 1) Door hardware.
  - 2) Light fixtures.
- C. Salvaged Items for Reuse in the Work: Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated. Salvage the following items for reuse:
  - 1) Doors.
  - 2) Door hardware.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. General: Provide handling, containers, storage, and transportation as required to implement waste management goals during entire duration of the Contract.
- B. Site Access and Temporary Controls:
  - 1) Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 2) Comply with Section 015000 – Temporary Facilities and Controls for controlling dust and dirt, environmental protection, and noise.

### **3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE**

- A. Recycling Receivers and Processors: Refer to Sonoma County Recycling Guide, and "Builder's Guide to Re-Use and Recycling" for a list of recycling receivers and processors in Sonoma County. These resources are provided to the Contractor for information only and are not intended to limit the Contractor's means or methods for achieving the goal of diversion of waste material from landfill.
- B. Recycling Incentive: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste material shall accrue to Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
  - 1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from the Project site. Include list of acceptable and unacceptable materials at each container and bin.
  - 2) Stockpile recyclable materials on site without interfering with other materials.
  - 3) Designate a specific area or areas on site to facilitate separation of materials. Clearly mark bins for each category of waste.
  - 4) Keep waste bins and pile areas neat and clean. Do not contaminate non-recyclable waste with materials designated for reuse or recycling.
  - 5) Remove recyclable waste off Library's property and transport to recycling receiver or processor.
- D. Environmental Controls during Handling, Storage, and Transport: Do not permit designated materials to become contaminated or to contaminate site or surrounding areas.
- E. Provide temporary protections to prevent water runoff which has been contaminated by recycled materials from entering storm water drainage system

### **3.3 HAZARDOUS WASTE**

- A. Hazardous Waste: Separate, store, and dispose of hazardous waste according to State regulations.
  - 1) Hazardous waste disposal information can be obtained from the Sonoma County Eco-Desk at 707-565-3375, or at [www.recyclenow.org](http://www.recyclenow.org).

- 2) Keep all shipping manifests and make available to the Library's Representative for auditing upon request.
- 3) Special wastes requiring Class II landfill disposal are considered hazardous waste, including, but not limited to:
  - a. Contaminated soil.
  - b. Treated wood.
  - c. Asbestos and asbestos-containing materials.
  - d. PCBs used in transformers and light fixture ballasts.
- 4) Deliver to a recycler the following mercury-containing products:
  - a. Fluorescent lamps.
  - b. High-pressure sodium lamps.
  - c. Mercury vapor lamps.
  - d. Mercury-containing thermostats and switches.
  - e. Metal halide lamps.
  - f. Neon lamps.

### **CONVERSION RATES TABLE**

The following conversion rates are estimates. The ranges vary widely, depending on how the materials are handled (compacted, loose, chipped, etc.). Use the conversion factors and receipts from previous projects to help you estimate the potential amount of materials and waste. Take into consideration the type and load of vehicles that will be used to haul the materials.

Ask your hauler or recycler to assist you in estimating these numbers.

<b>Material</b>	<b>Lbs/volume</b>	<b>Tons/cy</b>
Asphalt, crushed	45 lbs/cu. ft.	
Asphalt/paving, crushed	1,380 lbs/cy	0.7 tons/cy
Cardboard, corrugated, flattened boxes, loose	100 lbs/cy*	
Carpet & padding, loose	84.4 lbs/cy	
Cement, bulk	100 lbs/cu. ft.	
Cement, mortar	145 lbs/cu. ft.	
Concrete, scrap, loose	1,855 lbs/cy	0.9 tons/cy
Copper fittings, loose	1,048 lbs/cy	
Copper pipe, whole	211 lbs/cy	
Drywall	500 lbs/cy*	
Glass, broken	2,160 lbs/cy	
Gypsum, solid	142 lbs/cu. ft.	
Metal, scrap	1,000 lbs/cy*	
Steel, solid	487 lbs/cu. ft.	
Wood (chipped)	300 lbs/cy*	0.15 – 0.3 tons/cy
Mixed Construction and Demolition (C&D) Debris**	900 lbs/cy	0.45 tons/cy
Mixed Waste/Trash	350 lbs/cy*	0.5 – 0.175 tons/cy

\* USGBC Recommended weights

\*\* Construction and Demolition (C&D) Debris includes waste and recyclables generated from construction, renovation, and demolition or deconstruction of pre-existing structures. Land clearing debris including soil, vegetation, and rocks are not to be included.

**SAMPLE CONSTRUCTION WASTE MANAGEMENT LOG**

Total waste generated by project: \_\_\_\_\_ tons/cubic yards.

Material	Total Waste by Weight (Tons)	Diverted Waste by Weight (Tons)	Salvaged Waste by Weight (Tons)	Disposed at Landfill by Weight (Tons)	Hazardous Material by Weight (Tons)	Comments
Asphalt, crushed						
Asphalt/paving, crushed						
Cardboard, corrugated, flattened boxes, loose						
Carpet & padding, loose						
Cement, bulk						
Cement, mortar						
Concrete, scrap, loose						
Copper fittings, loose						
Copper pipe, whole						
Drywall						
Glass, broken						
Gypsum, solid						
Metal, scrap						
Steel, solid						
Wood (chipped)						
Mixed Construction and Demolition (C&D) Debris**						
Mixed Waste/Trash						

TOTAL: \_\_\_\_\_ Tons \_\_\_\_\_ Tons \_\_\_\_\_ Tons \_\_\_\_\_ Tons \_\_\_\_\_ Tons

TOTAL % Diverted from Landfill: \_\_\_\_\_ %

END OF SECTION

SECTION 017700

**CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

**1.1 SUMMARY**

A. Section Includes:

- 1) Description of Contract closeout procedures including:
  - a. Removal of Temporary Construction Facilities
  - b. Substantial Completion
  - c. Final Completion
  - d. Project Record Documents
  - e. Project Guaranty
  - f. Warranties
  - g. Turn-In
  - h. Release of Claims
  - i. Fire Inspection Coordination
  - j. Building Inspection Coordination

**1.2 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES**

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore permanent facilities used during construction to specified condition.
- D. Comply with paragraph 1.15 of Section 015000 (Temporary Facilities and Controls).

**1.3 SUBSTANTIAL COMPLETION**

- A. When Contractor considers Work or designated portion of the Work as Substantially Complete, submit written notice to Library, with list of items remaining to be completed or corrected.
- B. Within reasonable time, Library will inspect to determine status of completion.

- C. Should Library determine that Work is not Substantially Complete, Library will promptly notify Contractor in writing, listing all defects and omissions.
- D. Contractor shall remedy deficiencies and send a second written notice of Substantial Completion. Library will reinspect the Work. If deficiencies previously noted are not corrected on reinspection, then Contractor shall pay the cost of the reinspection.
- E. When Library concurs that Work is Substantially Complete, Library will issue a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified by Library.
- F. Manufactured units, equipment and systems that require startup must have been started up and run for periods prescribed by Library before a Certificate of Substantial Completion will be issued.
- G. A punch list examination will be performed upon Substantial Completion. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, Contractor will reimburse Library for costs associated with these visits.

#### **1.4 FINAL COMPLETION**

- A. Final Completion occurs when Work meets requirements for Library's Final Acceptance. When Contractor considers Work is Finally Complete, submit written certification that:
  - 1) Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
  - 2) Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of Library, and are operative.
  - 3) Work is complete and ready for final inspection.
- B. In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- C. When Library finds Work is acceptable and final closeout submittals are complete, Library will issue a Final Inspection Report informing Contractor that the Work is complete, that any further accumulation of Liquidated Damages, if any were assessed, stop, and that the Library will file the Notice of Completion with the Library Recorder. Should Library determine that Work is incomplete or Defective:
  - 1) Library promptly will so notify Contractor, in writing, listing the incomplete or Defective items.

- 2) Contractor shall promptly remedy the deficiencies and notify Library when it is ready for reinspection.
- D. Final adjustments of accounts:
- 1) Submit a final statement of accounting to Library, showing all adjustments to the Contract Sum and complete and execute Document 006400 (Affidavit and Release of Liens Form).
  - 2) If so required, Library shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

## **1.5 PROJECT RECORD DOCUMENTS**

- A. Contract Documents will not be closed out and final payment will not be made until completion and submittal of Project Record Documents described in Section 017839 (Project Record Documents).

## **1.6 PROJECT GUARANTY**

- A. Requirements for Contractor's guaranty of completed Work are included in Article 9 of Document 007200 (General Conditions). Contractor shall guaranty Work done under Contract against failures, leaks, or breaks or other unsatisfactory conditions due to defective equipment, materials, or workmanship, and perform repair work or replacement required, at Contractor's sole expense, for period of [x] year(s) from date of Final Acceptance.
- B. Neither recordation of Final Acceptance nor final certificate for payment nor provision of the Contract nor partial or entire use or occupancy of premises by Library shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.
- C. Library may make repairs to Defective Work as set forth in Document 007200 (General Conditions), paragraph 9.3.
- D. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to Library, Library shall have right to operate and use materials or equipment until said materials and equipment can, without damage to Library, be taken out of service for correction or replacement. Period of use of Defective materials or equipment pending correction or replacement shall in no way decrease guaranty period required for acceptable corrected or replaced items of materials or equipment.
- E. Nothing in this Section 017700 shall be construed to limit, relieve, or release Contractor's, Subcontractors', and equipment suppliers' liability to Library for damages sustained as result of latent defects in equipment caused by negligence of suppliers' age

nts, employees, or Subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by Library of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for Defective workmanship or Defective materials under laws of this State pertaining to acts of negligence.

## **1.7 WARRANTIES**

- A. Execute Contractor's Submittals and assemble warranty documents, and Installation, Operation, and Maintenance Manuals described in Section 013300 (Submittal Procedures), executed or supplied by Subcontractors, suppliers, and manufacturers. Contractor may submit documents in an electronic format acceptable to Library with prior approval of Library Project Manager.
  - 1) Provide table of contents and assemble in 8½ inches by 11 inches three-ring binder with durable plastic cover, appropriately separated and organized.
  - 2) Assemble in Specification Section order.
- B. Submit material prior to final Application for Payment.
  - 1) For equipment put into use with Library's permission during construction, submit within fourteen (14) Days after first operation.
  - 2) For items of Work delayed materially beyond Date of Substantial Completion, provide updated Submittal within fourteen (14) Days after acceptance, listing date of acceptance as start of warranty period.
- C. Warranties are intended to protect Library against failure of Work and against deficient, Defective, and faulty materials and workmanship, regardless of sources.
- D. Limitations: Warranties are not intended to cover failures that result from the following:
  - 1) Unusual or abnormal phenomena of the elements
  - 2) Vandalism after Substantial Completion
  - 3) Insurrection or acts of aggression including war
- E. Related Damages and Losses: Remove and replace Work which is damaged as result of Defective Work, or which must be removed and replaced to provide access for correction of warranted Work.
- F. Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than one year(s) after corrected Work was done, whichever is later.
- G. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.



- H. Warranty Forms: Submit drafts to Library for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.
  - 1) Warranty shall be countersigned by manufacturers.
  - 2) Where specified, warranty shall be countersigned by Subcontractors and installers.
- I. Rejection of Warranties: Library reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.
- J. Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one (1) year(s) minimum from date of Final Completion of entire Work except where:
  - 1) Detailed Specifications for certain materials, equipment or systems require longer warranty periods.
  - 2) Materials, equipment or systems are put into beneficial use of Library prior to Final Completion as agreed to in writing by Library.
- K. Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to Library free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of Library.

## **1.8 TURN-IN**

- A. Contract Documents will not be closed out and final payment will not be made until all keys issued to Contractor during prosecution of Work are turned in to Library.

## **1.9 RELEASE OF CLAIMS**

- A. Contract Documents will not be closed out and final payment will not be made until Document 006400 (Affidavit of Release of Liens Form) is completed and executed by Contractor and Library.

## **1.10 FIRE INSPECTION COORDINATION**

- A. Coordinate final fire inspection for the purpose of obtaining an occupancy certificate from Library Building Inspection Division and secure sufficient notice to Library to permit convenient scheduling (if applicable).

**1.11 BUILDING INSPECTION COORDINATION**

- A. Coordinate with Library a final inspection for the purpose of obtaining an occupancy certificate.

END OF SECTION

SECTION 017839

**PROJECT RECORD DOCUMENTS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1) Administrative and procedural requirements for the following Project Record Documents:
    - a. Project Record Drawings, Shop Drawings
    - b. Project Record Specifications
    - c. Project Record Product Data
    - d. Miscellaneous Project Record Submittals
- B. Specific Project Record Documents requirements that expand requirements of this Section may be included in the individual Sections of Divisions 2 through 49, if used.

**1.2 SUBMITTAL**

- A. At completion of Project, deliver Project Record Documents to Library. Project Record Documents required include:
  - 1) Marked-up copies of Drawings
  - 2) Marked-up copies of Shop Drawings
  - 3) Marked-up copies of Specifications, Addenda, Change Orders, and CCDs
  - 4) Marked-up Product Data submittals
  - 5) Final set of Project Record Drawings, including electronic version
  - 6) Final set of Project Record Specifications
  - 7) Final set of Project Record Product Data
  - 8) Record Samples
  - 9) Field records for variable and concealed conditions
  - 10) Record information on Work that is recorded only schematically
- B. Accompany submittal with transmittal letter containing:

- 1) Date
- 2) Project title and Library's Contract number
- 3) Contractor's name and address
- 4) Number and title of each Project Record Document
- 5) Certification that each document as submitted is complete and accurate, and signature of Contractor or Contractor's authorized representative.

### **1.3 GENERAL**

- A. Library will provide one full size set of Drawings and one (1) copy of the Project Manual for Contractor's use for recording as-built conditions.
- B. Post changes and Modifications to the Contract Documents as they occur. Do not wait until the end of the Project. Library may periodically review Project Record Documents to assure compliance with this requirement.
- C. Refer instances of uncertainty to Library for resolution.
- D. Maintenance of Documents and Samples:
  - 1) Store Project Record Documents and Samples in the field office apart from Contract Documents used for construction.
  - 2) Do not permit Project Record Documents to be used for construction purposes.
  - 3) Maintain Project Record Documents in good order and in a clean, dry, legible condition.
  - 4) Make Project Record Documents and Samples available at all times for inspection by Library.

### **1.4 PROJECT RECORD DRAWINGS, SHOP DRAWINGS, AND SAMPLES**

- A. Quality Draftsmanship: All Work on Project Record Drawings and Project Record Shop Drawings shall be performed by competent drafters and shall be clear and fully legible. Library shall be the sole judge of the acceptability of the Project Record Drawings and Project Record Shop Drawings.
- B. Mark-up Procedure: During the construction period, maintain a set of prints of Drawings and Shop Drawings for Project Record Documents purposes ("Field Set"). Stamp each document (on each sheet or page) "PROJECT RECORD" in 2-inch high letters. Also maintain a set of Samples for Project Record Documents purposes. Keep record documents current. Note: A reference by number to a Change Order, CCD, RFI, RFQ, RFP, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.

- 1) Mark Drawings and Shop Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
  - a. Dimensional changes to the Drawings and Shop Drawings
  - b. Revisions to details shown on the Drawings and Shop Drawings
  - c. Depths of various elements of foundation in relation to main floor level or survey datum
  - d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements
  - e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure
  - f. Locations of underground Work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub outs, invert elevations, and similar items
  - g. Actual numbering and set points of each electrical circuit
  - h. Field changes of dimension and detail
  - i. Revisions to routing of piping and conduits
  - j. Revisions to electrical circuitry
  - k. Actual equipment locations
  - l. Duct, conduit, and cable size and routing
  - m. Changes made by Change Order or CCD
  - n. Details not on original Drawings or Shop Drawings
- 2) Mark completely and accurately Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Drawings location.
- 3) Mark important additional information that was either shown schematically or omitted from original Drawings.
- 4) Note CCD numbers; Alternate numbers, Change Order numbers, and similar identification.
- 5) Mark Drawing and Shop Drawing sets with red, erasable colored pencil.
- 6) Mark Samples to record changes made after review

- 7) Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing or Shop Drawing data, whether the individual or entity is the installer, Subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings or Shop Drawings.
  - a. Accurately record information in an understandable and legible drawing technique.
  - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
- C. Preparation of Project Record Drawings and Project Record Shop Drawings: Thirty (30) days prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings and Project Record Shop Drawings with Library.

## **1.5 ADDITIONAL REQUIREMENTS FOR FINAL PROJECT RECORD DOCUMENTS**

- A. Thirty (30) days prior to Substantial Completion of the Work, Contractor will make available to Architect marked-up Drawings and Specifications, for Architect use in updating electronic drawing and specification files.
- B. After Substantial Completion and before Final Completion, Contractor shall carefully compare all data shown on the job set of Record Drawings with the corresponding record document computer files, prepared by Architect.
- C. Contractor shall clearly indicate on the Project Record Documents any changes that were not correctly transferred by the Architect. Contractor shall provide the correct information to the Architect.
- D. Contractor shall “cloud” all affected areas.

## **1.6 PROJECT RECORD SPECIFICATIONS**

- A. During the construction period, maintain one (1) copy of the Specifications, including Addenda and Modifications issued, for Project Record Documents purposes.
- B. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, Change Order and CCD Work, and information on concealed installation that would be difficult to identify or measure and record later.
  - 1) In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
  - 2) Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to

document coordination with Project Record Product Data submittals and Installation, Operation, and Maintenance Manuals.

- 3) Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in Installation, Operation, and Maintenance Manuals instead of submitted as Project Record Product Data.
- C. Preparation of Project Record Specifications: Thirty (30) days prior to inspection for Certification of Substantial Completion, review completed Field Set Project Record Specifications with Library. When authorized, prepare final Project Record Specifications.
- 1) After Substantial Completion and before Final Completion, carefully transfer all data shown on the Field Set to a separate clean set of Specifications provided by Library. Include the printed designation "PROJECT RECORD SPECIFICATION" in a prominent location on the Specifications.

## **1.7 PROJECT RECORD PRODUCT DATA**

- A. During the construction period, maintain one (1) copy of each Product Data submittal for Project Record Document purposes.
- 1) Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the Site, and changes in manufacturer's instructions and recommendations for installation.
  - 2) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 3) Note related Change Orders and mark-up of Project Record Drawings, where applicable.
  - 4) Upon completion of mark-up, submit a complete set of Project Record Product Data to Library for Library's records.
  - 5) Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
  - 6) Contractor is responsible for mark-up and submittal of Project Record Product Data for the Work.
- B. Material, Equipment, and Finish Data:
- 1) Provide data for primary materials, equipment, and finishes as required under each Specification Section.

- 2) Submit two sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.
- 3) Arrange by Specification Section number and give names, addresses, and telephone numbers of Subcontractors and suppliers. List:
  - a. Trade names
  - b. Model or type numbers
  - c. Assembly diagrams
  - d. Operating instructions
  - e. Cleaning instructions
  - f. Maintenance instructions
  - g. Recommended spare parts
  - h. Product data

#### **1.8 MISCELLANEOUS PROJECT RECORD SUBMITTALS**

- A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to Library for Library's records. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
  - 1) Field records on excavations and foundations
  - 2) Field records on underground construction and similar Work
  - 3) Survey showing locations and elevations of underground lines
  - 4) Invert elevations of drainage piping
  - 5) Surveys establishing building lines and levels
  - 6) Authorized measurements utilizing unit prices or allowances
  - 7) Records of plant treatment
  - 8) Ambient and substrate condition tests
  - 9) Certifications received in lieu of labels on bulk products
  - 10) Batch mixing and bulk delivery records
  - 11) Testing and qualification of tradespersons



- 12) Documented qualification of installation firms
- 13) Load and performance testing
- 14) Inspections and certifications by governing authorities
- 15) Leakage and water-penetration tests
- 16) Fire resistance and flame spread test results
- 17) Final inspection and correction procedures

END OF SECTION

SECTION 017900

**DEMONSTRATION AND TRAINING**

**PART 1 GENERAL**

**1.1 DEMONSTRATION AND TRAINING**

- A. Prior to acceptance of the Work, provide demonstration and training to Library staff:
  - 1. Operation and maintenance of all equipment; Installation, Operation, and Maintenance Manuals; and answer staff questions.
  - 2. Performed by manufacturer's representatives who have been factory-trained or factory-trained engineers, knowledgeable in the operation of the various types of equipment.
  - 3. Provide additional operator instruction and operation assistance as required in individual Specification Sections.
- B. Library may videotape instructions.
- C. Visits to the Site by manufacturer's representatives for demonstration and training purposes shall be deemed to be a separate visit to the Site, independent of visits required for equipment checkout, testing, and startup unless prior approval of Library Representative is received to combine visits.
- D. Schedule in writing with Library Representative at least thirty (30) Days in advance any visits to the Site by manufacturer's representatives for the purpose of fulfilling their operation and maintenance instruction requirements.
- E. Scheduling is subject to approval by Library Representative. Plan, unless otherwise required in individual Specifications Sections, to schedule training sessions so they occur after Work has been completed and the facilities are ready to start normal operation.

END OF SECTION

## **SECTION 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. General requirements and procedures for compliance with the following:
  - 1. Forest Stewardship Council (FSC) Certified Wood.
  - 2. California Code of Regulation Title 24 Part 11 California Green Building Standards Code (CALGreen) Non-Residential Mandatory Measures.
  - 3. Construction Waste Management and Disposal including salvaging, recycling, and disposing of demolition and construction waste.
  - 4. Construction indoor air quality management.
  - 5. Buy-Clean-California Act Environmental Product Declarations (EPD's) [State projects and certain local Authorities Having Jurisdiction]

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 74 19 - Construction Waste Management and Disposal.

#### **1.03 DEFINITIONS**

- A. Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that mill is certified for chain-of-custody by an FSC-accredited certification body.
- B. FSC Certified Wood: Wood products that are verified from the forest of origin through the supply chain to ensure that the forest products used are from responsibly harvested and verified sources.
- C. Product Category Rule (PCR): A PCR is a set of rules, requirements and guidelines for a product group.
- D. Environmental Product Declaration (EPD): An Environmental Product Declaration is an independently verified and registered document that communicates information about the life cycle environmental impact of products. The raw material producer conducts a product life cycle assessment and works with a program operator to verify and publish an EPD. An EPD needs to follow the guidelines of ISO 14025 (Type III Environmental Declarations – Principles and Procedures) and the applicable Product Category Rule (PCR).

## 1.04 SUBMITTALS

- A. FSC Certified Wood: Submit product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
- B. CALGreen: Additional CALGreen submittal requirements are included in other sections of the Specifications.
  - 1. CALGreen submittals are in addition to other submittals. If documentation is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to demonstrate compliance with indicated CALGreen requirements.
- C. Buy-Clean-California: Additional Buy-Clean-California submittal requirements are included in other sections of the Specifications.
  - 1. Buy-Clean-California submittals are in addition to other submittals. If documentation is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to demonstrate compliance with indicated Buy-Clean-California requirements.

## PART 2 PRODUCTS

### 2.01 CERTIFIED WOOD

- A. Not less than (50) percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
  - 1. Wood-based materials include but are not limited to the following materials when made from made wood, engineered wood products, or wood-based panel products:
    - a. Rough carpentry.
    - b. Miscellaneous carpentry.
    - c. Finish carpentry.
    - d. Architectural woodwork.
    - e. Wood flooring.
    - f. Wood cabinets.
    - g. Non-rented temporary construction, including bracing, concrete formwork, pedestrian barriers, and temporary protection.

### 2.02 LOW-EMITTING MATERIALS

- A. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management

district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene, and trichloroethylene), except for aerosol products as specified below.

- B. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.

<b>TABLE 5.504.4.1</b>	
<b>ADHESIVE VOC LIMIT (Notes 1,2)</b>	
Less Water and Less Exempt Compounds in Grams Per Liter	
<b>ARCHITECTURAL APPLICATIONS</b>	<b>CURRENT VOC LIMIT</b>
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesive not specifically listed	50
<b>SPECIALTY APPLICATIONS</b>	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
<b>SUBSTRATE SPECIFIC APPLICATION</b>	
Metal to metal	30

Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80
<b>Notes</b>	
1. If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168, <a href="http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF">http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF</a> .	
<b>TABLE 5.504.4.2</b>	
<b>SEALANT VOC LIMIT</b>	
Less Water and Less Exempt Compounds in Grams per Liter	
<b>SEALANTS</b>	<b>CURRENT VOC LIMIT</b>
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
<b>Note:</b> For additional information regarding methods to measure the VOC content specified in these tables, see South Coast Air Quality Management District Rule 1168.	

- C. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3, shall be determined by classifying the coating as a Flat, Nonflat, or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.
- D. Aerosol paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

<b>TABLE 5.504.4.3</b>	
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<b>VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (Notes 2, 3)</b>	
Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds	
<b>COATING CATEGORY</b>	<b>CURRENT LIMIT</b>
Flat coatings	50
Nonflat coatings	100
Nonflat-high gloss coatings	150
<b>SPECIALTY COATINGS</b>	
Aluminum roof coatings	400
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	150
Faux finishing coatings	350
Fire resistive coatings	350
Floor coatings	100
Form-release compounds	250
Graphic arts coatings (sign paints)	500
High temperature coatings	420
Industrial maintenance coatings	250
Low solids coatings (Note 1)	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	500
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers, and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs Clear	730
Shellacs Opaque	550
Specialty primers, sealers and undercoaters	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340

Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340
<b>Notes</b>	
1. Grams of VOC per liter of coating, including water and including exempt compounds	
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.	
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

- E. Carpet systems. All carpet installed in the building interior shall meet at least one of the following testing and product requirements:
1. Carpet and Rug Institute's Green Label Plus Program.
  2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.2, January 2017 (also known as CDPH Standard Method V1.2 or Specification 01350).
  3. NSF/ANSI 140 at the Gold level or higher.
  4. Scientific Certifications Systems Sustainable Choice.
  5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database.
- F. Carpet cushion. All carpet cushion installed in the building interior shall meet at least one of the following testing and product requirements:
1. Carpet and Rug Institute's Green Label program.
  2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.2, January 2017 (also known as CDPH Standard Method V1.2 or Specification 01350).



- G. Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.
- H. Resilient flooring systems. For 80 percent of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following :
  - 1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
  - 2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.2, January 2017 (also known as CDPH Standard Method V1.2 or Specification 01350).
  - 3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
  - 4. Products certified under the UL GREENGUARD Gold (formerly the Greenguard Children & Schools program).
- I. Composite wood products. Hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted by the ATCM must meet the specified emission limits as shown in Table 5.504.4.5.

<b>TABLE 5.504.4.5</b>	
<b>FORMALDEHYDE LIMITS (Note 1)</b>	
Maximum Formaldehyde Emissions in Parts per Million	
<b>PRODUCT</b>	<b>CURRENT LIMIT</b>
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard (Note 2)	0.13
<b>Notes</b>	
1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E1333. For additional information, see California Code of Regulations, Title 17, Sections 93120 through 93120.12.	
2. Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

- J. Thermal insulation shall comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical

Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).

1. See California Department of Public Health's website for certification programs and testing labs.
  2. Provide documentation verifying that thermal insulation materials meet the pollutant emission limits.
- K. Acoustical Ceilings and Wall Panels shall comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350).
1. See California Department of Public Health's website for certification programs and testing labs.
  2. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.

### **2.03 BUY-CLEAN-CALIFORNIA ACT REQUIREMENTS**

- A. Comply with California Public Contract Code 3500-3505. Submit Environmental Product Declarations documenting that the Global Warming Potential (GWP) for the following materials does not exceed the limits established by the State of California Department of General Services (DGS):
1. Concrete Reinforcing Steel: Carbon steel reinforcing bar.
  2. Structural Steel.
  3. Mineral wool board insulation.
  4. Flat glass.
- B. Informational resources:
1. <https://programoperators.org>
  2. <https://www.dgs.ca.gov/PD/Resources/Page-Content/Procurement-Division-Resources-List-Folder/Buy-Clean-California-Act>
- C. Structural steel and carbon steel rebar
1. Title: North American Product Category Rule for Designated Steel Construction Products
  2. Valid through: August 26, 2025
  3. Version: 2.0

4. Program operator: UL Environment
- D. Flat glass
1. Title: GANA PCR for Flat Glass: UN CPC 3711
  2. Valid through: September 30, 2025
  3. Program operator: NSF International
- E. Mineral wool board insulation
1. Title: Part B: Building Envelope Thermal Insulation EPD requirements
  2. Valid through: April 10, 2023
  3. Version: 2.0
  4. Program operator: UL Environment

### **PART 3 EXECUTION**

#### **3.01 CONSTRUCTION WASTE MANAGEMENT**

- A. Comply with Section 01 74 19 - Construction Waste Management and Disposal.

#### **3.02 POLLUTANT CONTROLS**

- A. CALGreen Requirements:
1. Comply with CALGreen 5.504.3 regarding covering of duct openings and protection of mechanical equipment during construction
  2. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system. .
  3. Comply with SMACNA Indoor Air Quality (IAQ) Guideline for Occupied Buildings under Construction if permanent heating, cooling, and ventilating systems are in use during selective demolition operations

#### **3.03 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT**

- A. Comply with SMACNA IAQ Guideline for Occupied Buildings under Construction.
1. If Owner authorizes the use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 1 Section "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each

return-air inlet for the air-handling system used during construction.

2. Replace all air filters immediately prior to occupancy. Replacement air filters shall have a MERV 13 according to ASHRAE 52.2.
3. Contractor must comply with the IAQ Management Plan that Contractor develop and submits. The Plan must meet the SMACNA guidelines referenced herein.

B. Flush Building :

1. Conduct a two-week building air flush-out after construction ends with new air filters and 100 percent outdoor air. Replace air filters after building air flush-out. Replacement air filters shall have a MERV 13 according to ASHRAE 52.2.

**END OF SECTION**

## **SECTION 02 41 13 - SELECTIVE DEMOLITION**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

A. Section Includes

1. Selective demolition of building elements as indicated.
2. Pollutant control measures.
3. Protection of existing building finishes during demolition and construction, including, but not limited to, wood paneling and trim.
4. Protection of fixed casework, and similar elements not indicated to be removed.
5. Construction waste reduction, disposal, and recycling including required documentation for Construction Waste Management Plan and its implementation.

B. Related Sections

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Section 01 10 00 - Summary: For items to be salvaged.
3. Section 01 74 19 - Construction Waste Management and Disposal: For procedures and documentation associated with demolition waste.
4. Section 01 81 13 - Sustainable Design Requirements: For pollutant control and indoor air quality management during selective demolition operations.
5. Division 22 - Plumbing: For demolition requirements as specified and as indicated on the Drawings.
6. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC): For demolition requirements as specified and as indicated on the Drawings.
7. Division 26 - Electrical: For demolition requirements as specified and as indicated on the Drawings.
8. Division 27 - Communications: For demolition requirements as specified and indicated on the Drawings.

#### **1.02 REFERENCES**

A. ANSI/ASSE - American National Standards Institute/American Society of Safety Engineers

1. A10.6 - Safety Requirements for Demolition Operations.

- B. EPA - Environmental Protection Agency
- C. NFPA - National Fire Protection Association
  - 1. 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

### 1.03 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
  - 1. Storage or sale of removed items or materials on-site is not permitted.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to the Owner's designated storage area.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, at the Contractor's option and at no additional cost, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
- E. Materials Ownership: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

### 1.04 SUBMITTALS

- A. CALGreen submittals: Refer to Section 01 74 19 - Construction Waste Management and Disposal for planning and documentation of construction waste resulting from demolition activities.
  - 1. Construction Waste Management Plan: Prepare and submit in accordance with CALGreen requirements.
  - 2. Construction Waste Management Worksheets: Prepare and submit in accordance with CALGreen requirements.
  - 3. Construction Waste Management Acknowledgment: Prepare and submit in accordance with CALGreen requirements.
- B. Schedule of selective demolition activities indicating the following:
  - 1. Interruption of utility services and security devices.

2. Coordination for shutoff, capping, and continuation of utility services and security devices.
  3. Locations of temporary barricades, partitions, and means of egress.
  4. Above items shall be shown on Preliminary schedule, Final Schedule, and 3-week look aheads. Final dates of shutdowns are required no less than 10 days prior to activity in a request to Program Manager in writing.
- C. Construction Logistics Plan indicating the following:
1. Barricades and enclosures.
  2. Laydown and staging area.
- D. Inventory of items to be removed and salvaged.
- E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
1. Wood paneling, ceilings, soffits, and trim not indicated to be removed.
- F. Record Drawings at Project Closeout: Identify and accurately locate capped utilities and other subsurface structural, electrical, plumbing, mechanical and security devices.

#### **1.05 QUALITY ASSURANCE**

- A. Regulatory Requirements
1. Comply with governing EPA notification regulations before beginning selective demolition.
  2. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- C. Predemolition Conference: Conduct conference at Project site.

#### **1.06 PROJECT CONDITIONS**

- A. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner as far as practical.
- B. Portions of site, immediately adjacent to selective demolition area will be occupied. Conduct selective demolition so Owner's operations will not be disrupted.
- C. The Community Room in the building will be occupied or used by Owner. Its usage and access by Owner shall not be disrupted during construction.

- D. Asbestos: If any previously unidentified materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Architect and the Owner.

### **1.07 WARRANTIES**

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition by methods and with materials so as not to void existing warranties.

## **PART 2 - PRODUCTS NOT USED**

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that utilities have been disconnected and capped where indicated.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
  - 1. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated plumbing, mechanical, electrical, security, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
- E. Survey the condition of the buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structures during selective demolition.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### **3.02 UTILITY SERVICES**

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized by the Owner. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to governing authorities.
    - a. Provide not less than 10 calendar days' notice to the Owner if shutdown of service is required during changeover.



2. Sitework will affect existing irrigation services. Provide not less than 72 hours' notice to the Owner when shutdown of irrigation service is required during sitework. Temporarily reconnect irrigation service to maintain irrigation in operation during construction.
- B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving portions of the buildings or sitework to be selectively demolished.
1. Arrange to shut off indicated utilities with the Owner.
  2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
  3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

### **3.03 PREPARATION**

- A. Conduct demolition operations and remove debris to ensure minimum interference with streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction.
- B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Owner.
  2. Protect existing site improvements, appurtenances, and landscaping to remain.
  3. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces to ensure that no water leakage or damage occurs to structure or interior areas.
  4. Protect walls, ceilings, floors, fixed audience seating, and other existing finish work that are to remain and are exposed during selective demolition and construction operations.
    - a. Exercise care to protect existing wood paneling and ceilings to remain.
  5. Cover and protect furniture, furnishings, and equipment that have not been removed.
- C. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
1. Construct dustproof partitions of not less than nominal 4 inch studs and 1/2-inch fire retardant plywood on the demolition side; seal joints and perimeter.

2. Non-plastic sheet materials shall be used to further mitigate dust and shall not trap moisture; seal to prevent dust penetration.
- D. Provide and maintain interior and exterior bracing or structural support to preserve stability and prevent movement, settlement, or collapse of portions of building to be selectively demolished.
1. Strengthen or add new supports when required during progress of selective demolition.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### **3.04 POLLUTANT CONTROLS**

- A. CALGreen Requirements: Refer to Section 01 81 13 - Sustainable Design Requirements for requirements for temporary ventilation and pollutant control.
1. Comply with CALGreen 5.504.3 regarding covering of duct openings and protection of mechanical equipment during construction
  2. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system. .
  3. Comply with SMACNA Indoor Air Quality (IAQ) Guideline for Occupied Buildings under Construction if permanent heating, cooling, and ventilating systems are in use during selective demolition operations
- B. Use temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
- D. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

### **3.05 SELECTIVE DEMOLITION**

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing

regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.
  5. Maintain adequate ventilation when using cutting torches.
  6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  9. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- B. Demolish concrete in small sections. Cut concrete at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

### **3.06 MANAGEMENT OF DEMOLISHED MATERIALS**

- A. Recycle and/or salvage for reuse non-hazardous demolition waste in accordance with requirements of Section 01 74 19 - Construction Waste Management. Remove from site all materials not to be reused on site.
- B. Store items to be salvaged and reinstalled in a secure and protected location until ready for reinstallation.
- C. Burning: Do not burn demolished materials.

**3.07 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
- B. Return adjacent areas to condition existing before selective demolition operations began.
- C. Sweep the building broom clean on completion of selective demolition operation.

**END OF SECTION**

## **SECTION 03 30 00 - CAST-IN-PLACE CONCRETE FOR INTERIOR WORK**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Slabs on grade.
- B. Concrete reinforcement.
- C. Underslab vapor barrier.
- D. Joint devices associated with concrete work.
- E. Concrete underlayment and topping over existing concrete depressed slab
- F. Concrete curing.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Refer to Structural Drawings for additional requirements.
- C. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- D. Section 03 35 44 - Polished Concrete Finishing.
- E. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- F. Section 09 05 61 - Common Work Results for Flooring Preparation: Floor preparation for applied floor finishes.

#### **1.03 REFERENCE STANDARDS**

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- B. ACI 301 - Specifications for Concrete Construction; 2020.
- C. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.
- D. ACI 305R - Guide to Hot Weather Concreting; 2020.
- E. ACI 308R - Guide to External Curing of Concrete; 2016.
- F. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).

- G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- I. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- J. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- K. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2021.
- L. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.
- M. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals:
  - 1. For CALGreen 5.504.4.3 - Finish Material Pollutant Control, Paints and Coatings: Product data for coatings including printed statement of chemical composition and VOC content of each product used.
- B. Refer to Structural Drawings for additional requirements.
- C. Samples: Submit samples of underslab vapor retarder to be used.
- D. Test Reports: Submit report for each test or series of tests specified.
- E. Submit plan view of location of expansion, control joints and isolation joints.

#### **1.05 QUALITY ASSURANCE**

- A. For concrete underlayment and topping, submit manufacturer's recommendation letter of the performing contractor's qualification for installation of products. Contact local manufacturer's rep.

### **PART 2 PRODUCTS**

#### **2.01 PRODUCT REQUIREMENTS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.

## **2.02 REINFORCEMENT MATERIALS**

- A. Refer to Structural Drawings for additional requirements.

## **2.03 CONCRETE MATERIALS**

- A. Refer to Structural Drawings for additional requirements.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.

## **2.04 ACCESSORY MATERIALS**

- A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
  - 1. Installation: Comply with ASTM E1643.
  - 2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
  - 3. Manufacturers:
    - a. Fortifiber Building Systems Group ; Moistop Ultra 10: [www.fortifiber.com/#sle](http://www.fortifiber.com/#sle).
    - b. Stego Industries, LLC: [www.stegoindustries.com/#sle](http://www.stegoindustries.com/#sle).
    - c. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).

## **2.05 SEPARATE FLOOR TOPPINGS**

- A. Hydraulic Cement Underayment:
  - 1. Self-leveling underlayment that consists of a blend of Portland cements, other hydraulic cements and polymers that is used to level and smooth interior concrete, terrazzo, well-bonded ceramic & quarry tile, epoxy coating systems and properly prepared, non-water-soluble adhesive residue on concrete prior to the installation of finished flooring on all grade levels.
  - 2. Product compatible with Architectural Concrete Floor Topping to receive Mechanical Polish Concrete where fill depth exceeds 1 inch, with build up to 2" depth.
  - 3. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F+/-3°F (23° C+/-3°C) and 50% +/-5% relative humidity:
    - a. Application: Barrel Mix or Pump
    - b. Flow Time: 10 minutes

- c. Final Set: Approx. 90 minutes
  - d. Compressive Strength: 4500 psi (315 kg/cm<sup>2</sup>) at 28 days, ASTM C109M.
  - e. Flexural Strength: 1000 psi (70 kg/cm<sup>2</sup>) at 28 days, ASTM C348.
  - f. VOC: 0
4. Manufacturers:
- a. ARDEX V1200 Self-Leveling Underlayment; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, [www.ardexamericas.com](http://www.ardexamericas.com)
  - b. CTS Cement Manufacturing Corporation; LevelFlor: [www.ctscement.com/#sle](http://www.ctscement.com/#sle).
  - c. SpecChem, LLC; SpecFlow: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
- B. Architectural Concrete Floor Topping and Resurfacer:
- 1. Portland Cement-based Self-Leveling Topping to Suitable to Receive a Mechanical Polish Concrete.
  - 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70°F (21°C) and 50% +/- 5% relative humidity:
    - a. Flow Time: 10 minutes
    - b. Initial Set: Approx. 10 minutes
    - c. Final Set: Approx. 45 minutes
    - d. Compressive Strength: 6100 psi (42.06 N/mm<sup>2</sup>) at 28 days, ASTM C109M
    - e. Flexural Strength: 1200 (8.27 N/mm<sup>2</sup>) psi at 28 days, ASTM C78
    - f. VOC: 0
  - 3. Manufacturers:
    - a. ARDEX PC-T™ Polished Concrete Topping; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, [www.ardexamericas.com](http://www.ardexamericas.com)
    - b. CTS Cement Manufacturing Corporation; TRU PC Polished Concrete: [www.ctscement.com/#sle](http://www.ctscement.com/#sle).
    - c. SpecChem, LLC; SpecLevel PCT: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).



4. Primer: Epoxy primer. Product shall be part of floor topping manufacturer's approved system.
5. Water: shall be clean, potable and sufficiently cool (not warmer than 70°F/21°C).
6. Repair materials:
  - a. If necessary, correct excessive pinholes with product approved by the floor topping manufacturer's technical representative for this purpose.
7. Integral color
  - a. Powder or liquid pigments can be utilized for integral pigmentation provided by floor topping manufacturer. The pigments must be suitable for use with a cementitious product.
  - b. Color: Natural gray.
8. Concrete treatments for floor topping shall be designed for use in conjunction with the installation of the floor topping system. Acceptable products include:
  - a. Densifier: Lithium Hardener for polished concrete topping.
  - b. Finish Treatment: Product recommended by floor topping manufacturer's technical services representative for stain and wear protection

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
  1. Complying with ASTM C881/C881M and of Type required for specific application.
- C. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

## **2.07 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Refer to Structural Drawings for additional requirements.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in accordance to bonding agent manufacturer's

instructions.

1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
  2. Use latex bonding agent only for non-load-bearing applications.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

### **3.02 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS**

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Refer to Structural Drawings for additional requirements.

### **3.03 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Refer to Structural Drawings for additional requirements.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Finish floors level and flat.

### **3.04 SLAB JOINTING**

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

### **3.05 SEPARATE FLOOR TOPPINGS**

- A. Inspect all concrete substrates and conditions under which the floor topping system is to be installed.

- B. Verify that existing concrete has cured a minimum of 28 days and meets the requirement of a minimum 3000 psi compressive strength, a minimum 100 pcf density and a minimum 200 psi tensile strength.
- C. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before priming. Mechanically clean if necessary. Acid etching and the use of sweeping compounds and solvents are not acceptable.
- D. Mechanical preparation of the surface is required to obtain a minimum ICRI Concrete Surface Profile of 3 (CSP 3).
- E. Substrates shall be inspected for moisture or any other conditions that could affect the performance of the floor topping system. Moisture vapor emissions shall not exceed 85% RH, ASTM F 2170. For areas where moisture vapor emissions exceed the specified limits consult the floor topping manufacturer's technical representative and provide the recommended moisture control system.
- F. Joint and Crack Preparation: Honor all joints and moving cracks up through the floor topping system, including expansion joints, isolation joints and control joints (saw cuts).
  - 1. All non-moving cracks shall be filled with crack and joint repair products recommended by the floor topping manufacturer's technical representative.
- G. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- H. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- I. Concrete shall be mechanically prepared to achieve a concrete surface profile (CSP) 3 in accordance with ICRI standards and primed with floor topping manufacturer's recommended product. Follow manufacturer's installation instructions.
- J. Place concrete floor toppings to required lines and levels.
  - 1. Utilize self-leveling underlayment where recommended by manufacturer to reduce depth of floor topping to receive mechanically polished floor finish.
  - 2. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- K. Mix floor topping product in accordance with manufacturer's published instructions.
  - 1. Use product from the same batch to minimize color variation.
- L. Aggregate mix: For pre-leveling and areas to be installed over 2" (5 cm) thick, wellgraded, washed pea gravel may be added to reduce material costs. Mix the powder with water first, and then add from 1 part by volume of aggregate (1/8" to 3/8" [3 to 9.5 mm]). Do not use sand. Follow aggregate installation instructions provided by the floor topping manufacturer.

- M. Integral Color: The maximum amount of pigment for powdered pigments is 2% of the total weight of the floor topping mix.
- N. Installation:
  - 1. The minimum installation thickness shall be 3/8" (9 mm). The necessary thickness will vary with jobsite conditions, and must be adequate to achieve the desired finish.
    - a. Pour and spread in place with the spreader and roller equipment approved by the floor topping manufacturer.
    - b. Limit worker walking on floor topping and require shoes with non-metallic cleats to avoid leaving marks in the liquid topping.
- O. Screed toppings level, maintaining surface flatness of maximum 1:1000.
- P. Allow the floor topping compound to cure a minimum of 24 to 72 hours before proceeding with the polishing process. Drying time is a function of jobsite temperature and humidity conditions, as well as the installation thickness.
- Q. Refer to Section 03 35 44 - Polished Concrete Finishing - for finishing requirements.

### **3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES - GENERAL**

- A. Maximum Variation of Surface Flatness:
  - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
  - 2. Under Carpeting: 1/4 inch in 10 feet.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### **3.07 CONCRETE FINISHING - GENERAL**

- A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
  - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
  - 3. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces

to be polished.

4. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

B. Concrete Polishing: See Section 03 35 44 - Polished Concrete Finishing

### **3.08 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Surfaces Not in Contact with Forms:
  1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
  2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
  3. Final Curing: Begin after initial curing but before surface is dry.

### **3.09 FIELD QUALITY CONTROL**

- A. Provide free access to concrete operations at project site and cooperate with Testing Laboratory.
- B. Refer to Structural Drawings for additional requirements.

### **3.10 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION**

**SECTION 03 30 01 – CAST-IN-PLACE CONCRETE FOR EXTERIOR WORK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete Forms
  - 1. Walkways
  - 2. Utility Pads
- B. Concrete Reinforcing
  - 1. Detailing
  - 2. Bending
  - 3. Placement
  - 4. Amounts of cover for cast-in-place concrete
  - 5. Anchor bolts
  - 6. Dowels
  - 7. Inserts
  - 8. Lap Splices
- C. Curing Compound and Sealer

**1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 32 11 23 – Aggregate Base.

### 1.03 REFERENCE STANDARDS

- A. ACI 304 - Guide for Measuring, Mixing, Transporting and Placing Concrete
- B. ACI 305R – Guide to Hot Weather Concreting
- C. ACI 306R – Guide to Cold Weather Concreting
- D. ACI 308 – Guide to External Curing of Concrete
- E. ACI 309 - Guide for Consolidation of Concrete
- F. ACI 315 – Guide to Presenting Reinforcing Steel Design Details
- G. ACI 318 - Building Code Requirements for Structural Concrete and Commentary
- H. ASTM C33 - Standard Specification for Concrete Aggregates
- I. ASTM C94 - Standard Specification for Ready-Mixed Concrete
- J. ASTM C150 - Standard Specification for Portland Cement
- K. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- L. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete
- M. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- N. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- O. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete
- P. California Code of Regulations (CCR):
  - 1. CCR Title 8, Chapter 4, Subchapter 4 – Construction Safety Orders
  - 2. CCR Title 24, Part 2, California Building Code, Chapter 33, Section 3303, Protection of Pedestrians during Construction or Demolition

### 1.04 SUBMITTALS

- A. Product Data
  - 1. Curing / Sealing Compounds
  - 2. Admixtures

- 3. Source of Concrete and Aggregates
- B. Curing
  - 1. Curing Method
- C. Test Reports
  - 1. Mill Test Reports
    - a. Reinforcing Steel
    - b. Cement
  - 2. Concrete Mix Designs: Trial mixes including water-cement-fly ash ratio curves, concrete mix ingredients and proportions, and admixtures.
  - 3. Grout Mix: To include mix ingredients, strength and shrinkage data.
- D. Delivery: With each batch of concrete, furnish certified delivery tickets listing information in Paragraphs 13.1 and 13.2 of ASTM C94. Maximum delivery temperature of concrete is 100 degrees Fahrenheit (F). Minimum delivery temperature as follows:

Atmospheric Temperature	Minimum Concrete Temperature
30 degrees to 40 degrees F	60 degrees F
0 degrees to 30 degrees F	70 degrees F

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Portland Cement: Clean, fresh, Type II, low alkali, Portland cement conforming with ASTM C150.
- B. Pozzolan Fly-ash to be in conformance with ASTM C618.
- C. Aggregates
  - 1. Aggregates to be uniformly graded with a one inch maximum size for all concrete mixes.
  - 2. Natural aggregates to be free from deleterious materials, conforming to ASTM C33. Aggregate is not to be potentially reactive as defined in Appendix XI of ASTM C33. Aggregates to be thoroughly and uniformly washed before use.
- D. Mixing Water



1. Fresh, clean, potable and free from oil, acid, alkali, organic matter or other deleterious substances.

E. Admixtures

1. Admixtures, if used to be of a type conforming to ASTM C494 that increases the workability of the concrete, will not impair the strength of the concrete, and is not used to reduce the cement content of the mix. Do not use Calcium Chloride.

F. Liquid Membrane-Forming Curing Compound

1. Is to be clear or translucent, suitable for spray application and is to conform to ASTM C309, Type 1.

G. Cement Grout:

1. Non-shrink type composed of one part cement, two parts sand and the minimum amount of water necessary to obtain the desired consistency.

H. Properties

1. 28 day strength of concrete in place to be a minimum of:
  - a. 3,000 psi for walkways and utility pads
2. The maximum water/cement ratio to be 0.44.
3. Slump of concrete and not to exceed four (4) inches unless otherwise authorized by Owner.
4. 15% of cement weight may be Pozzolan Fly-Ash. Pozzolan Fly-Ash to be in conformance with ASTM C618.

## **2.02 REINFORCING STEEL**

- A. Bar reinforcement to be ASTM A615, Grade 60.

## **PART 3 EXECUTION**

### **3.01 FORMS**

- A. Reinforcing detailing, bending, and placing: In accordance with ACI 315 and ACI 318.
- B. Reinforcing steel to be provided with the following amounts of cover for cast-in-place concrete:
  - 1. Concrete deposited against earth: three inches
  - 2. Concrete surface (formed) exposed to earth or weather:
    - a. #6 through #18 bars – two inches
    - b. #5 bar and smaller: 1-1/2 inches
- C. All reinforcing steel, anchor bolts, dowels, and inserts to be accurately placed and securely held in place prior to placing concrete or grout.
- D. Horizontal bars to lap a minimum of 16 gauge black annealed wire chairs or concrete “dobies.”

### **3.02 MIXING CONCRETE**

- A. All concrete materials to be measured accurately for each batch and mixed thoroughly until aggregate is coated with mortar. Combined ingredients to be mixed for a minimum of 1-1/2 minutes.
- B. Concrete batching and mixing to comply with ACI 318 and ASTM C94, delivered to site. Batch mixing at the Site is not permitted

### **3.03 PLACING CONCRETE**

- A. Preparation
  - 1. Remove hardened concrete, wood chips, shavings and other debris from forms.
  - 2. Remove hardened concrete and foreign materials from interior surfaces of mixing and conveying equipment.
  - 3. Have reinforcement inspected and approved by City Engineer before depositing concrete.
  - 4. Forms and reinforcing bars to be clean and wetted prior to placing of the concrete.

5. Place anchor bolts and other embedments, as indicated.

B. Conveying Concrete

1. Convey concrete from mixer to final place of deposit by a method that will prevent segregation. Method of conveying concrete is subject to approval of Owner.

C. Placing

1. Concrete to be placed in conformance with the recommendations of ACI 304.
2. Do not place concrete when weather conditions prevent proper placement and consolidation, or when concrete has attained its initial set, or has contained its water or cement content more than 1-1/2 hours.
3. Deposit concrete as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
4. Do not drop concrete freely more than five feet. Where greater drops are required, use a tremie or flexible spout attached to a suitable hopper.
5. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 20 inches in thickness, and space tremies such as to provide a minimum of lateral movement of concrete.
6. Continuously place concrete until an entire unit between construction joints is placed. Rate and method of placing concrete to be such that no concrete between construction joints will be deposited upon or against partly set concrete.
7. Continuously place all concrete with no more than 10 minutes elapsed time between pours. Sequence concrete pours such that each pour is placed on or adjacent to concrete that has been in place no more than 10 minutes.

D. Consolidation

1. Conform to ACI 309. Immediately after depositing, spade concrete next to forms, into corners and recesses, work around reinforcement and into angles of forms, tamp lightly by hand, and compact with mechanical vibrator. Vibrate concrete to produce thorough compaction, leaving no voids, complete embedment of reinforcement and concrete of uniform and maximum density without segregation of mix. Do not transport concrete in forms by vibration. Carry on vibration continuously with placing of concrete. Do not insert vibrator into concrete that has begun to set.

### **3.04 HOT OR COLD WEATHER**

- A. Follow the recommendations of ACI 305R and ACI 306R for hot and cold weather conditions.

### 3.05 CONCRETE FINISHES

- A. Finish of formed surfaces to be smooth and free of fins, honeycomb, or segregation. When defects occur, they are to be remedied by chipping cavities and patching, or by other methods approved by Owner.
- B. Exposed surfaces to be "sacked" by rubbing cement mortar into voids with burlap or canvas. Fins to be ground smooth and loose mortar to be removed.
- C. Vertical edges of the walls to have 3/4-inch chamfer.
- D. Horizontal edges of the walls to have 1/2-inch chamfer.
- E. Unformed surfaces to be steel troweled to a smooth dense finish. After the trowel finish has sufficiently hardened, walking surfaces of the entire surface to be given a medium broom finish perpendicular to the direction of travel. The broom finish to be applied just prior to the application of the curing compound/sealer.

### 3.06 PROTECTION AND CURING

- A. In conformance with ACI 308, except as otherwise specified herein.
- B. Initial curing to immediately follow the finishing operation. Protect exposed surfaces of concrete from premature drying, wash by rain and running water, wind, mechanical injury, and excessively hot or cold temperatures. Concrete not covered with membrane or other curing material to be kept continuously wet for at least seven days after placing. High-early-strength concrete net curing period to be not less than three days. Keep wood forms continuously wet to prevent moisture loss until forms are removed. Cure exposed concrete surfaces as described below. Other curing methods may be used if approved by Owner.
  - 1. Liquid Curing and Sealing Compounds
    - a. Apply by spray or roller in accordance with the manufacturer's instructions. Apply immediately after finishing. Maximum coverage to be 400 square feet per gallon on steel troweled surfaces, and 300 square feet per gallon on floated or broomed surfaces for the curing/sealing compound.
  - 2. Plastic sheets
    - a. Apply as soon as concrete has hardened sufficiently to prevent surface damage. Utilize widest practical width sheet and overlap adjacent sheets two inches. Tightly seal joints with tape.
  - 3. Paper
    - a. Utilize widest practical width paper and overlap adjacent sheets two inches. Tightly seal joints with sand, wood planks, pressure-sensitive tape, mastic or glue.

- C. Provisions are to be made to keep overspray for curing/sealing compounds from extending beyond bridge deck surface. Spray of curing/sealing compounds to cease if sustained winds exceed 10 miles per hour.

**3.07 CLEANING**

- A. Cleaning of equipment for delivery or placement of concrete is prohibited on site.

**3.08 ACCEPTANCE**

- A. Walking surfaces are to be free from trowel marks, uniform in appearance and with a surface plane tolerance not exceeding 1/4 inches in any 10 foot 0 inch when tested with a ten foot straightedge.

**END OF SECTION**

## **SECTION 03 35 44 - POLISHED CONCRETE FINISHING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Finishing of concrete topping surfaces to receive polished finish.
- B. Floor flatness performance requirements for polished concrete floors, above standard flatness requirements in Section 03 30 00.

#### **1.02 RELATED SECTIONS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 81 13 - Sustainable Design Requirements : Requirements for low-emitting materials.
- C. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Standard floor flatness performance requirements.
- D. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Self-Leveling Underlayment and Floor Topping systems.

#### **1.03 ACTION SUBMITTALS**

- A. Product Data: Manufacturer's technical data sheets and installation instructions for each product specified including the following:
  - 1. Liquid surface treatment.
  - 2. Floor polish.
- B. Samples: For each type, material, color and pattern of polished concrete and accessory required, showing the full range of color, texture, and pattern variations expected. Label each polished concrete sample to identify aggregate types, sizes and proportions. Prepare samples of same thickness and from same materials to be used for the Work in size indicated below:
  - 1. Polished concrete: 12" square samples.
- C. CALGreen Submittals:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For firms indicated in "Quality Assurance" Article, including lists of completed projects with project names and addresses, names and addresses of architects, owners, and other information specified.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data:
  - 1. Include manufacturer's instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
  - 2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

#### **1.06 QUALITY ASSURANCE**

- A. Polisher Qualifications:
  - 1. Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
  - 2. Supervision: Maintain competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman or Master Craftsman by CPAA.
  - 3. Manufacturer Qualification: Approved by manufacturer to apply liquid applied products.
- B. Static Coefficient of Friction: Achieve not less than 0.5 for level floor surfaces as determined by quality control testing according to ANSI/NFSI B101.1.
- C. Walkway Auditor: Certified by NFSI to test polished floors for static coefficient of friction according to ANSI/NFSI B101.1.
- D. Liquid Surface Treatment Applicator Qualifications:
  - 1. Provide letter of certification from manufacturer stating that the applicator is an approved applicator of the product system, is in good standing, and is familiar with the proper manufacturer's procedures and installation requirements.
  - 2. Provide a list of a minimum of 5 projects performed of similar type, size and complexity.
- E. Ensure slab surface is protected from equipment scrapes, impact abrasions, etc.

- F. Source Limitations: Obtain each specified material from one source and from a single manufacturer.
- G. Single Source Responsibility: Provide required material complete, produced by the same manufacturer.

#### **1.07 PRE-INSTALLATION CONFERENCE**

- A. Pre-Installation Conference: Prior to initiating concrete floor polishing operations, conduct conference at Project site.
  - 1. Required Attendees:
    - a. Owner.
    - b. Architect.
    - c. Contractor, including supervisor.
    - d. Concrete finisher and his foreman.
    - e. Concrete polisher and his foreman.
    - f. Technical representative of liquid applied product manufacturers.
    - g. Walkway auditor.
  - 2. Determine at what stage in construction floors are to be finished.
  - 3. Review patching requirements and relationship to polishing operations for existing floor penetrations.
  - 4. Review procedures, materials, techniques, and coordinate related work and shutdowns.
    - a. Tour mock-up and representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of procedures, and other preparatory work performed by other installers.
    - b. Review Contract Document requirements.
    - c. Review approved submittals.
    - d. Review procedures, including, but not limited to:
      - 1) Concrete pour procedures to ensure workers do not walk in freshly placed concrete to prevent foot prints from telegraphing through to the surface of the polished concrete.



- 2) Details of each step of grinding, honing, and polishing operations.
  - 3) Application of liquid applied products and stage in the polishing operations they should be applied.
  - 4) Protecting concrete floor surfaces until polishing work begins.
  - 5) Protecting polished concrete floors after polishing work is completed.
- B. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

#### **1.08 DELIVERY, STORAGE AND HANDLING**

- A. Deliver the specified products in original, unopened containers with legible manufacturer's identification and information.
- B. Store specified products in conditions recommended by the manufacturer.
- C. Deliver materials in manufacturer's original containers, with seals unbroken, bearing manufacturer's labels indicating brand name, batch/lot numbers and directions for storage.
- D. Dispense special concrete finish materials from factory numbered and sealed containers. Maintain record of batch/lot numbers.
- E. Submit record of batch/lot numbers to liquid surface treatment manufacturer for validation and issuance of warranties at the conclusion of the applications.

#### **1.09 SITE CONDITIONS**

- A. Coordinate the work so as not to delay other work in progress.
- B. Maintain the immediate work areas clear of other trades, pedestrian traffic and disturbances immediately prior to and during polishing operations.
- C. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.
- D. Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.
- E. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
  1. During Concrete Pour: Do not permit workers to walk through concrete pour during placement as foot tracks may telegraph to the surface when floors are polished.
  2. Inspect and Diaper all hydraulic powered equipment to avoid staining of the concrete.
    - a. Ensure vehicles and equipment used on slabs have tires that will not leave marks.

3. Prohibit vehicle parking over concrete surfaces to be polished.
    - a. If necessary to complete their scope of work, place drop cloths under vehicles at all times.
  4. Prohibit pipe cutting and threading operations over concrete surfaces to be polished.
  5. Prohibit ferrous metals storage over concrete surfaces to be polished.
  6. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces to be polished.
  7. Protect from acids and acidic detergents contacting concrete surfaces to be polished.
  8. Protect from painting activities over concrete surfaces to be polished.
- F. Close areas to traffic during polishing operations and, after completion of polishing, for time period recommended in writing by manufacturer.
- G. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid applied product application.
1. Dispose of used or diluted liquid surface treatment chemicals and wash water according to applicable Governmental standards.
- H. Protection: Precautions shall be taken to avoid damage or contamination of any surfaces near the work zone.

## **PART 2 PRODUCTS**

### **2.01 PRODUCT REQUIREMENTS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Improve performance of floor by installation of polished concrete floor system as measured by the following criteria:
1. Static Coefficient of Friction: Achieve the following for level floor surfaces as determined by quality control testing according to ANSI/NFSI B101.1:
    - a. Dry Surface: 0.80.
    - b. Wet Surface: 0.74.
  2. Specular Gloss/Reflectance, ASTM D 523:

- a. 20 Degrees: 3.66 degrees.
  - b. 60 Degrees: 23.7 degrees.
  - c. 85 Degrees: 30.6 degrees.
3. Floor Surface Profile, ASTM E 1155:
- a. Floor Flatness Number (FF): 50.
  - b. Floor Levelness Number (FL): 35.

### **2.03 MANUFACTURERS**

- A. Basis-of-Design Product: The design for the floor polishing system is based on the manufacturer identified below. :
1. Basis-of-Design: ARDEX PC 10™ Lithium Hardener for ARDEX PC-T™ Polished Concrete Topping; Color: Gray
  2. Subject to compliance with requirements, provide the named products or comparable products by one of the following:
    - a. CTS TRU PC Polished Concrete system.
    - b. SpecChem SpecLevel PCT system.

### **2.04 EQUIPMENT**

- A. Field Grinding and Polishing Equipment:
1. Variable speed, machine with planetary/counter rotating concrete grinding heads, walk-behind machine with not less than 600 pounds of down pressure on grinding or diamond polishing pads.
  2. Use dust extraction equipment with flow rate suitable for dust generated, with squeegee attachments.
- B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produces same results, without noticeable differences, as field grinding and polishing equipment.
- C. Burnishing Equipment: High speed walk-behind or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.
- D. Metal Bonded Pads: Grinding pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.

- E. Resin Bonded Pads: Polishing pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.
- F. Burnishing Pads: Maintenance pads for use with high speed burnishing equipment.

## **2.05 POLISHING MATERIALS**

- A. Refer to Section 03 30 00 - Cast-In-Place Concrete - for densifier and surface sealing products for the floor topping system.
- B. Protective Cover: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION, GENERAL**

- A. Verification of Conditions: Examine areas and conditions under which work will be performed and identify conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected
- B. Verify that floor topping has cured in accordance with manufacturer's recommendations prior to proceeding with finishing operations.
- C. Application is to take place at least 10 days prior to installation of shelving or other built-in furniture or casework, in order to provide a complete, uninhibited concrete slab for application.

### **3.02 EXAMINATION FOR POLISHING**

- A. Acceptance of Surfaces and Conditions:
  - 1. Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
  - 2. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
  - 3. Starting work within a particular area will be construed as acceptance of surface conditions.

### **3.03 PREPARATION FOR POLISHING**

- A. Correct cracks and abrupt changes in surface profile. Remove fins and projections.
- B. Remove all curing compounds and sealers.
- C. Examine slab surface prior to starting work, with liquid surface treatment applicator present, for any conditions affecting the Applicator's ability to properly apply the liquid surface treatment. Do not proceed until unsatisfactory conditions are corrected.

- D. Prior to application, verify that floor surfaces are free of laitance.
- E. Do not allow vehicular traffic on the slab.
- F. Report in writing surfaces left in improper condition by other trades.
- G. Commencement of finishing procedures will constitute applicators acceptance of conditions.

### **3.04 POLISHING**

- A. Sequence of Polishing: Perform polishing after partition studs are erected, but before gypsum board is installed.
- B. Examination and Preparation:
  - 1. Immediately prior to starting work, verify that surfaces conform to product manufacturer's requirements for substrate conditions.
  - 2. Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with liquid surface treatment material.
  - 3. Prior to application, verify floor is free of latent salts, curing membrane, bond- breaker, laitance and any other residues that are detrimental to achieving surface appearance requirements.
  - 4. Beginning of liquid surface treatment application indicates acceptance of existing conditions.
- C. Treating Surface Imperfections:
  - 1. Mix patching compound and grout material with dust created by grinding operations to match color of adjacent concrete surface.
  - 2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids.
  - 3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.
- D. Liquid Densifier Application:
  - 1. Apply products to substrates in accordance with manufacturer's instructions, and application procedures.
  - 2. Apply to clean, dry, and properly prepared surfaces approved by the Architect.
  - 3. Do not dilute or alter product. Apply as packaged.
  - 4. Do not apply to painted surfaces.

5. Allow applied material to remain on the surface for reaction for time period recommended by manufacturer. If the material puddles on surface, move applied material around with a micro fiber pad to achieve uniform coverage. Do not apply additional material.
  6. Allow applied material on surface to dry, approximately 30 to 60 minutes before polishing to next level. If white residue appears on surface after drying, material will be removed with additional polishing steps.
- E. Comply with flooring system manufacturer's recommendations and instructions regarding preparation and mixing of materials and application of each component of floor finishing system.
1. Employ methods to ensure concrete surface is not damaged during application, including discoloration.
  2. Apply liquid surface treatment in accordance with latest manufacturer's published instructions.
  3. Whitening of concrete by over-application or inadequate removal of liquid surface treatment may be cause for rejection.
- F. Grout Grinding:
1. Use grinding equipment and appropriate grit grinding pads.
  2. While applying fresh grout material prior to, grind concrete in direction perpendicular to initial grinding to remove scratches.
  3. Vacuum floor using squeegee vacuum attachment after each pass.
- G. Honing:
1. Use grinding equipment with resin bonded grinding pads.
  2. Grind concrete in one direction starting with 50 grit pad and make as many sequential passes required to remove scratches, each pass perpendicular to previous pass, up to 400 grit pad reaching maximum refinement with each pass before proceeding to finer grit pads.
  3. Auto scrub or vacuum floor using squeegee vacuum attachment after each pass.
- H. Polishing:
1. Use polishing equipment with resin bonded polishing and burnishing pads.
  2. Begin polishing in one direction starting with 60 grit pad.

3. Make sequential passes with each pass perpendicular to previous pass using finer grit pad with each pass, up to 800 grit.
  4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
  5. Auto scrub or vacuum floor using squeegee vacuum attachment after each pass.
  6. Continue polishing until gloss appearance, as measured according to ASTM E430, matches approved field mock-ups.
  7. Ensure that there are no visible "disc marks" on polished concrete finished floor.
- I. Polish Guard: Uniformly apply and remove excessive liquid according to manufacturer's instructions.
- J. Final Polish: Using burnishing equipment and finest grit burnishing pads, burnish to uniform sheen matching approved mock-up or samples.
- K. Final Polished Concrete Floor Finish:
1. Class C - Medium Aggregate Finish: Remove not more than 1/8 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying medium aggregate with no, or small amount of, large aggregate at random locations.
  2. Level 2 - Satin (Honed) Appearance:
    - a. Procedure: Not less than 6 steps with full refinement of each diamond pad up to 400 grit resin bonded pad with one application of densifier.
    - b. Gloss: Images of objects being reflected have a matte appearance; 10-39 Image Clarity Value, %; Haze Index < 10

### **3.05 FIELD QUALITY CONTROL**

- A. Field Testing: Engage a qualified walkway auditor to perform field testing according to ANSI/NFSI B101.1 to determine if polished concrete floor finish complies with specified static coefficient of friction.
- B. Inspect completed polished concrete floor system with Contractor, Architect, Owner's Representative, and Installer.
- C. Review procedures with Architect to correct unacceptable areas of completed polished concrete floor system.
- D. Testing: Test the following from completed polished concrete floor system:
1. Static Coefficient of Friction, Engage a qualified walkway auditor to perform field testing according to ANSI/NFSI B101.1 to determine if polished concrete floor finish complies with specified static coefficient of friction:

- a. Dry surface.
  - b. Wet surface.
  2. Specular Gloss/Reflectance, ASTM D523:
    - a. 20 degrees.
    - b. 60 degrees.
    - c. 85 degrees.
  3. Floor Surface Profiles, ASTM E1155:
    - a. Floor Flatness Number (FF).
    - b. Floor Levelness Number (FL).
- E. Test Results:
1. Report test results in writing to Contractor, Architect, and Owner's Representative within 24 hours after tests.
  2. Compare test results from tests performed before and after installation of polished concrete floor system.

### **3.06 CLEANING**

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.

### **3.07 DEMONSTRATION**

- A. Maintenance Training: CPAA Master Craftsman shall train Owner's designated personnel in proper procedures for maintaining polished concrete floor.

### **3.08 PROTECTION**

- A. Restrict foot traffic for a minimum of 72-hours after final application of sealer.
- B. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.
- C. Do not permit marking of the finished floor, even with pencil. Do not apply chemicals of any kind.
- D. Do not permit spills of any kind from coming in contact with finished floors as they will be impossible to remove without damaging the finish.



- E. Leave finished work and work area in a neat, broom-clean condition without evidence of spillovers onto adjacent areas.
- F. Architect and Owner will review protection procedures to approve their adequacy.

**END OF SECTION**

## **SECTION 05 11 00 - STRUCTURAL AND MISCELLANEOUS STEEL**

### **PART 1 – GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes: All labor, materials, equipment and operations required to complete structural and miscellaneous metals in shapes and configurations indicated; including:
  - 1. Structural steel columns, beams, bracing, base plates, bolts, joist hangers, and stud bolts welded to structural steel.
  - 2. Miscellaneous structural steel and connections; fabricated connectors and hangers installed by related sections.
  - 3. Anchor bolts and steel inserts embedded in concrete or masonry, installed by related sections.
  - 4. Fabricated steel items embedded in concrete or masonry installed by related sections.
  - 5. Supervision of anchor bolt setting, leveling and elevations to insure required fit of steel work.
  - 6. Shop priming and field touch-up, galvanizing.
  - 7. Bracing, Shoring, Fabrication and Erection.
- B. Related Sections:
  - 1. Pertinent sections of Division 01 specifying Quality Control and Testing Agency services.
  - 2. Pertinent Sections of other Divisions specifying concrete reinforcement, formwork, concrete, structural and miscellaneous metal fabrications, steel joists, metal decking, cold-formed metal framing, rough carpentry.

#### **1.2 REFERENCES**

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 22 Steel.
- B. American Institute of Steel Construction (AISC) 303 "Code of Standard Practice for Steel Buildings and Bridges".
- C. AISC 360 "Specification for Structural Steel Buildings".
- D. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel".
- E. Underwriters Laboratories (UL) FRD "Fire Resistance Directory".

#### **1.3 SUBMITTALS**

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- D. Shop drawings: Submit each building as a complete unit. Do not mix components from multiple buildings or units of work in a submittal. Include all of the following;
  - 1. Profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
  - 2. Fabrication tolerances for all steel.
  - 3. Connections: All, including type and location of shop and field connections.
  - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths, type, size, and sequence. Designate demand critical welds.
  - 5. Designation of Seismic Force Resisting System (SFERS) members and connections. Locate and dimension protected zones. Brace frame gusset plates shall be drawn to scale.
  - 6. Cross-reference all shop drawing detail references to contract document detail references.
  - 7. Secure all field measurements as necessary to complete this work prior to submitting shop drawings for review.
  - 8. Provide holes, welded studs, etc. as necessary to secure work of other sections.
  - 9. Provide the following as separate submittals for each building or unit of work:
    - a. Bolt and anchor setting plans.
    - b. Layout, fabrication and erection drawings.
- E. Certifications:
  - 1. Steel Materials: Submit the following for identified materials.
    - a. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
    - b. Mill Test Reports: Indicate structural strength, destructive test analysis, and non-destructive test analysis.

- c. Contractor's affidavit certifying that all identified steel materials provided are of the grades specified and match the certificates supplied.
2. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification per AWS D1.1.
- F. Samples: Provide samples to the Testing Agency as specified in Article SOURCE QUALITY CONTROL, at no additional costs.

#### 1.4 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies, refer to pertinent sections of Division 01 and CBC Chapter 17.
- B. All tests shall be performed by a recognized testing agency as specified in pertinent sections of Division 01.
- C. Certification and Identification of Materials and Uses: Provide Testing Agency with access to fabrication plant to facilitate inspection of steel. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and all material identification/test information listed below.
  1. Test all steel as required by ASTM A6.
  2. Provide manufacturer's Mill Test Reports for all materials. Include chemical and physical properties of the material for each heat number manufactured. Tag all fabricated materials with heat number.
  3. Provide letter certifying all materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location of each material type and/or heat number in the project (i.e. walls, braced frames etc.).
  4. Unidentified Material Tests: Where identification of materials by heat number or mill tests cannot be made, Owner's Testing Agency shall test unidentified materials.
  5. Provide all certification, verifications, and other test data required to substantiate specified material properties at no additional cost to the Owner.
- D. Testing and Inspection: Tests and Inspections performed by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with pertinent sections of Division 01.
- E. The following standards are the minimum level of quality required. Provide higher quality work as specifically indicated in the Contract Documents.
  1. Workmanship and details of structural steel work shall conform to the CBC and AISC 360.
  2. The quality of materials and the fabrication of all welded connections shall conform to AWS D1.1.
  3. Comply with Section 10 of AISC 303 for architecturally exposed structural steel.

- F. The Testing Agency will review all submittals and testing of materials.
- G. All re-inspections made necessary by non-conforming work shall be at the Contractor's expense.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to project site in bundles marked with durable tags indicating heat number, mill, member size and length, proposed location in the structure and other information corresponding with markings shown on placement diagrams.
- B. Handle and store materials above ground to prevent damage, contamination or accumulation of dirt or rust.

### **1.6 SCHEDULING AND SEQUENCING**

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
- B. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Structural Steel Plates: ASTM A36 or ASTM A572 Gr. 50 or ASTM 529 Gr. 50
- B. HSS (Hollow Structural Sections):
  - 1. Round: ASTM A500, Gr. C.
  - 2. Rectangular or Square: ASTM A500, Gr. C.
- C. Bolts, Nuts, and Washers: ASTM A307 Grade A machine bolts with ASTM A563 Grade A nuts and ASTM F844 washers to match. See FINISHES section for galvanization, where required.
- D. Anchor Bolts/Rods, Nuts, and Washers: ASTM F1554 Gr. 36 or 55 with ASTM A563 Grade A nuts and ASTM F436 Type 1 washers. Grade DH nuts where Grade 105 rod is specified. No upset thread allowed.
- E. Arc-Welding Electrodes: AWS Standards E70 or equivalent, except no E70T-4 allowed.
- F. Other Welding Materials: AWS D1.1; type required for materials being welded.
- G. Welded Headed/Threaded Studs: ASTM A108. Minimum yield strength is 51,000 pounds per square inch.

### **2.2 ACCESSORIES**

- A. High Strength Grout: ASTM C1107, non-shrink, premixed compound consisting of aggregate, cement, and water reducing plasticizing agents. Minimum compressive strength  $f'_c = 7000$  psi at 28 days. Non-metallic where exposed to view. BASF "MasterFlow 928" or equivalent.

- B. Building Structural Steel Primers: Comply with local VOC limitations of authorities having jurisdiction and the California Green Building Code. Verify compatibility with finish coats specified in other sections. Follow manufacturers printed instructions. Apply one coat unless otherwise directed.
1. Type A: Self-Crosslinking Hydrophobic Acrylic passing 2000 hours ASTM D4585 and 7000 hours ASTM D5894. "Series 115 Uni-Bond DF" by Tnemec (2.0 to 4.0 mils DFT).
  2. Type B: Organic Zinc-Rich Urethane passing 50,000 hours ASTM B117 and 15000 hours ASTM G85. "Series 90-97 Tneme-Zinc" by Tnemec (2.5 to 3.5 mils DFT) or "Series 94-H20 Hydro-Zinc" by Tnemec (2.5 to 3.5 mils DFT).
  3. Type C: MIO-Zinc Filled Urethane passing 10,000 hours ASTM B117 and 5000 hours ASTM D4585. "Series 394 PerimePrime" by Tnemec (2.5 to 3.5 mils DFT).

### 2.3 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind welds smooth where exposed to view and where noted on drawings.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Protect all materials, before and after fabrication, from rust, corrosion, dirt, grease, and other foreign matter.
- E. Fabricate framing members free from twists or bends. Form holes, cut and sheared edges neatly without kinks, burrs, or warped edges.
- F. Exposed Steel: Straight, smooth, free of nicks, scars or dents.
- G. Gas Cutting: Gas cutting of holes in a member shall not be permitted.
- H. Splicing of members: Members requiring splicing due to length requirements may be spliced using full penetration butt welds when such welds and procedures are inspected and certified by the Testing Agency, in conformance with AWS and AISC standards. The location of splices shall be approved by the Architect/Engineer in writing prior to fabrication.
- I. Welding: Welding of structural steel connections shall be performed by qualified welders in accordance with AWS Standards. All weld sizes shall match those shown on the drawings.
1. Preparation: Clean all surfaces free of rust, paint and all foreign matter. Remove paint or scale by brushing, chipping or hammering as required. Chip clean and wire brush burned or flame cut edges before welding. Space and alternate welds, clamping as necessary to prevent warp or misalignment.
  2. Sequence Welding: When welds enclose, or partially enclose, the perimeter or portion of the surface of a member, make weld bead in sequence, or staggered. Minimize internal stresses. Weld groups of members occurring in a single line in staggered sequence to minimize distortion of the structural frame.

3. Faulty and Defective Welding: Welds failing to meet AWS standards and the Contract Documents shall be rejected and remade at Contractor expense. All welds showing cracks, slag inclusion, lack of fusion, bad undercut or other defects, ascertained by visual or other means of inspection shall be removed and replaced with conforming work.
  4. Minimum Weld Strengths: All welds shall match the minimum weld sizes recommended by AISC. Details of fabrication not specifically shown shall match similar details which are specifically shown. All bevel and groove welds shall be full penetration unless size is noted otherwise.
  5. Threaded studs, headed studs, and deformed bar anchors shall be full-fusion welded conforming to ASW D1.1.
- J. Grinding: Grind smooth the following structural steel and connections;
1. Exposed cut ends of structural and fabricated shapes.
  2. All welds exposed to view.
  3. Mitered and fit-up corners and intersections.
- K. Back-Up Bars: Required for all complete penetration welds.
- L. Bolt Holes: Edge, end distances and spacing shall conform to dimensions shown on the drawings, and as follows;
1. Round: Size indicated and 1/16 inch maximum oversize
  2. Slotted: At locations specifically noted on the drawings, provide size indicated and 1/16 inch by 1/4 inch oversize slotted in direction perpendicular to applied loads.
  3. Holes in base plates for anchor bolts may be 1/8 inch oversize.

## 2.4 FINISHES

- A. Prepare and finish structural and miscellaneous steel component surfaces as follows, unless a higher standard-of-care is determined necessary:
1. Unpainted, interior, dry exposure surfaces need not be primed.
- B. Do not prime the following surfaces unless otherwise indicated:
1. Connections to be field welded.
  2. Steel in contact with concrete.
  3. Surfaces to receive welded metal decking.
- C. Do not cover up work with finish materials until inspection is complete and work is approved by the Testing Agency.

## 2.5 SOURCE QUALITY CONTROL

- A. An independent Testing Agency will perform source quality control tests and submit reports, as

specified in pertinent sections of Division 01.

**B. Steel Materials Testing:**

1. No testing is required for materials identified in accordance with CBC 2203.1 (heat number, grade stencil, etc.).
2. Unidentified steel- General: Test all structural shapes. In addition, test to verify  $F_y$  and  $F_u$  values when engineering requirements exceed  $F_y = 25$  ksi for design.

**C. Shop Welding Inspection:**

1. Testing Agency shall inspect and certify all structural welds, unless the fabricating shop has been accredited in conformance with CBC requirements. Submit certification to the Architect/Engineer for review and the Building Official for approval.
2. Welder Qualifications: Welding inspector shall verify that all the welders are properly qualified prior to steel fabrication and state the qualifications of each welder in the welding inspection report.
3. Welding Inspection: Continuous inspection required unless otherwise noted below. Comply with requirements of AWS D1.1.
  - a. Welding Inspector shall check all welds, materials, equipment and procedures.
  - b. Welding Inspector shall provide reports certifying the welding is as required and has been done in conformity with the plans, specifications and codes.
  - c. Welding Inspector shall use radiographic, ultrasonic, magnetic particle, or any other necessary aid to visual inspection to assure adequacy of welds.
4. Periodic Inspection Acceptable:
  - a. Single pass fillet welds not exceeding 5/16 inch.

- D. Bolts, Nuts, and Washers:** Provide samples to Testing Agency for required testing, at no additional cost.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

### **3.2 ERECTION**

- A. Erect structural steel in compliance with AISC 303.
- B. Framing:
1. Erect all structural steel true and plumb.
  2. Verify proper final alignment prior to making final connections.



## C. Field Connections:

1. Workmanship of field bolted and welded connections shall conform in all respects to methods and tolerances specified for fabrication.
2. Field weld components indicated on shop drawings. Sequence field welds to minimize built-up stress and distortion of the structural frame. Verify sequence with Engineer. Coordinate field welding schedule with Testing Laboratory.
3. Welded Studs: Install in accordance with manufacturer's instructions and structural welding code AWS D1.1.

## D. Column base plates: Set level to correct elevations, support temporarily on steel wedges, shims, or leveling nuts where shown, until the supported members are plumbed and base plate is grouted.

1. Grout solid the full bearing area under base plates prior to installation of floor and/or roof decks.
2. Comply with manufacturer's instructions for high strength grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

## E. Bolting:

1. Inspect mating surfaces to ensure that bolt head and nut will have full bearing and that metal plies will mate flush between bolts.
2. Install bolts in matching holes. Do not distort metal or enlarge holes by drifting during assembly. Remake mismatched components to achieve tolerances indicated.
3. Holes mismatched in excess of 1/8 inch will be rejected.
4. Holes mismatched less than 1/8 inch may be reamed to the next larger size bolt.
5. Do not enlarge holes by flame cutting or air/arc ("plasma") cutting.
6. Provide flat washer(s) at over-size holes.
7. Provide washer at bolt head and nut where connected part is less than 1/4 inch thick.
8. Provide ASTM F436 beveled washers when the slope of the surfaces of parts in contact with the bolt head or nut is greater than 1:20.
9. Do not install bolts with damaged threads.
10. Threads shall commence outside of the shear plane.
11. Machine Bolts (MB): Install and tighten to a snug condition (ST) such that laminated surfaces bear fully on one another, using an impact wrench or "full effort" of an installer using a standard spud wrench.

## F. Supports, Shoring and Bracing: Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of

erection and installation of permanent bracing. Conform to requirements of all applicable laws and governing safety regulations. Resist imposed loads, including those of stored materials and equipment.

1. Provide all temporary supports, shoring and bracing necessary to achieve work of tolerances indicated.
  2. Provide all necessary temporary flooring, planking and scaffolding required for erection of steel, and support of erection machinery.
  3. Construction Loading: Do not overload the structure or temporary supports with stored materials, equipment or other loads.
  4. Maintain temporary bracing and shoring until work is complete, and longer as required to ensure stability and safety of structure.
- G. Do not make final connections until structure is aligned to meet specified tolerances.

### **3.3 ERECTION TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

### **3.4 FIELD QUALITY CONTROL**

- A. The independent Testing Agency will perform field quality control tests, as specified in pertinent sections of Division 01.
- B. Field Welding Inspection: Conform to all requirements of section SOURCE QUALITY CONTROL.
  1. Inspect mating surfaces.
  2. Test all materials prior to use. Use only materials meeting specified requirements.

### **3.5 ADJUSTING**

- A. Touch-up damaged finishes with compatible specified primer.
- B. Replace defective or damaged work with conforming work. Replace all defective work at Contractor's expense.
- C. Straighten materials by means that will not injure the materials.
- D. Replace defective or damaged work which cannot be corrected in the field with new work, or return defective items to the shop for repair.
- E. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.
- F. Pay expenses incurred by Owner for Architect/Engineer's costs for (re-)design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently

scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.

- G. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.

### **3.6 CLEANING AND PROTECTION**

- A. Clean all surfaces upon completion of erection; leave free of grime and dirt. Remove unused materials, tools, equipment and debris from the premises and leave surfaces broomed clean.
- B. Protect work from damage by subsequent operations.

**END OF SECTION**

## **SECTION 05 50 00 - METAL FABRICATIONS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Shop fabricated steel items.
- B. Metal Fabrications not specified in Section 05 11 00 - Structural and Miscellaneous Steel.

#### **1.02 RELATED REQUIREMENTS**

- A. A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Placement of metal fabrications in concrete.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
- G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- I. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- J. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- K. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi

Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.

- L. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- N. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- P. SSPC-SP 2 - Hand Tool Cleaning; 2018.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36/A36M.
- B. Plates: ASTM A283/A283M.
- C. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

#### **2.02 MATERIALS - FINISHES**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Architectural Paints and Coatings including aerosol paint and coating systems.

- B. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### **2.03 FABRICATION**

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### **2.04 FINISHES - STEEL**

- A. Prime paint steel items.
  - 1. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

### **2.05 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

#### **3.02 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on shop drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

#### **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

## **SECTION 05 52 13 - PIPE AND TUBE RAILINGS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Wall mounted handrails.
- B. Guardrails on roof

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 018113: Requirements for low-emitting materials.
- C. Section 05 11 00 - Structural and Miscellaneous Steel
- D. Section 09 21 16 - Gypsum Board Assemblies:
- E. Section 09 90 00 - Painting and Coating - LEED v4/Green Product Guide Spec: Field Painting.

#### **1.03 REFERENCE STANDARDS**

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- D. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- G. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- H. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- I. SSPC-SP 2 - Hand Tool Cleaning; 2018.



#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Fabricator's Qualification Statement.

#### **1.05 QUALITY ASSURANCE**

- A. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
- B. Fabricator Qualifications:
  - 1. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- C. Metal Jointing and Finish Quality Levels:
  - 1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
    - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
    - b. Welds Exposed to View: Ground smooth and flush.
    - c. Mechanical Joints: Butted tight, flush, and hairline.
    - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
    - e. Exposed Edges and Corners: Eased to small uniform radius.
    - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.

## **PART 2 PRODUCTS**

### **2.01 RAILINGS - GENERAL REQUIREMENTS**

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Allow for expansion and contraction of members and building movement without damage to connections or members.
- C. Dimensions: See drawings for configurations and heights.
  - 1. Top Rails and Wall Rails: 1-1/4 inch, minimum, to 1-1/2 inches, maximum diameter, round.
  - 2. Posts: 1-1/4 inch, minimum, to 1-1/2 inches, maximum diameter, round.
- D. Provide anchors and other components to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
  - 2. For anchorage to stud walls, provide backing plates, for bolting anchors.
- E. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

### **2.02 STEEL RAILING SYSTEM**

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- D. Exposed Fasteners: No exposed bolts or screws.
- E. Straight Splice Connectors: Steel concealed spigots.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
  - 1. All exterior railing systems to be galvanized.
  - 2. All exterior railing systems to be galvanized and shop primed for painting in the field.

3. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
1. All interior railing systems to be shop primed for painting in the field.

### **2.03 FABRICATION**

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured.
- D. Welded Joints:
1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
  2. Interior Components: Continuously seal joined pieces by continuous welds.
  3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Weld connections that cannot be shop welded due to size limitations.
1. Weld in accordance with AWS D1.1/D1.1M.
  2. Match shop welding and bolting.
  3. Clean welds, bolted connections, and abraded areas.
  4. Touch up shop primer and factory-applied finishes.
  5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

### **2.04 STEEL FINISHES**

- A. Shop Primer: Refer to Section 018113: Requirements for low-emitting materials, Architectural Paints and Coatings including aerosol paint and coating systems.
- B. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, and comply with VOC limitations of authorities having jurisdiction.

- D. Primer for Interior and Exterior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum  
Primer: Factory-formulated acrylic water-based rust-inhibitive metal primer. Apply at a dry film thickness of not less than 2.2 mils
  - 1. Basis of Design: PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).
- E. Primer for Items Indicated to Receive High Performance Coating: Shop-apply.
  - 1. Basis of Design: PPG Amercoat 68HS Zinc Rich Epoxy.
- F. Shop Finishing
  - 1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
  - 2. Do not prime surfaces in direct contact with concrete or where field welding is required.
  - 3. Prime Painting: Use specified shop- and touch-up primer.
  - 4. Preparation of Steel: In accordance with SSPC-SP 2 Hand Tool Cleaning.
  - 5. Number of Coats: One.
  - 6. Provide shop primer compatible with specified high performance coating at exterior installations.
  - 7. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
  - 8. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

## **2.05 ALUMINUM FINISHES**

- A. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- B. Color: To be selected by Architect from manufacturer's standard line.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.

- B. Supply items required to be cast into concrete with setting templates, for installation as work of other sections.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

## **SECTION 06 10 00 - ROUGH CARPENTRY**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes: All labor, materials and equipment and all operations required to complete all rough carpentry and structural framing as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
1. Structural floor, wall, and roof framing.
  2. Floor, wall, and roof sheathing.
  3. Rough hardware, framing connectors and fasteners.
  4. Treatment of wood.
  5. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and other work requiring supporting blocking.
  6. Miscellaneous wood nailers and furring strips, including roof applications, other wood framing, furring, shims or blocking as required to complete the work.
- B. Related Sections:
1. Pertinent sections of Division 01 specifying Quality Control and Testing Agency services.
  2. Pertinent sections of Division 01 specifying Structural Product Requirements: Structural Product Options, Substitution procedures and limitations, transportation, handling and storage.
  3. Pertinent sections of Division 03 specifying wood formwork construction and/or setting anchors in concrete.
  4. Pertinent section of Division 06 specifying wood construction and materials.
  5. Pertinent sections of other divisions specifying steel or concrete construction.

#### **1.2 REFERENCES**

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 23 Wood.
- B. American National Standards Institute (ANSI) / American Wood Council (AWC) "NDS - National Design Specification for Wood Construction".
- C. National Institute of Standards and Technology (NIST) / Engineered Wood Association (APA) "PS 1 - Voluntary Product Standard for Structural Plywood".
- D. NIST / APA "PS 2 - Performance Standard for Wood-Based Structural-Use Panels".

- E. NIST "PS 20 - American Softwood Lumber Standard".
- F. Redwood Inspection Bureau (RIS) "Standard Specifications for Grades of California Redwood Lumber".
- G. West Coast Lumber Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber No. 17".
- H. Western Wood Products Association (WWPA) "Western Lumber Grading Rules".
- I. American Wood Preservers Association (AWPA) "Book of Standards".

### 1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. Submit for review prior to fabrication. Submittals that do not meet these requirements will be returned for correction without review.
  - 1. Substitutions for products specified require conformance to substitution requirements in Division 01.
  - 2. Review of materials and hardware for substitution to products specified is at the additional expense of the Contractor.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.
- C. Product Data:
  - 1. Submit manufacturer's product data, specifications, and installation instructions for & location of framing connectors, wood preservative materials, application instructions, and fasteners. Include complete, accurate equivalence data when submitting alternate products to those specified. Provide samples of these items upon request.
  - 2. Submit product data and current ICC-ES report for machine-driven nails, fasteners, and equipment, including dimensions of all fasteners, including head, shank diameter and length.
  - 3. Submit samples of each and every type and size of proposed machine-driven nails and fasteners.
- D. Shop drawings: For manufactured wood products, submit each building as a complete unit. Do not mix components from multiple buildings or units of work in a submittal. Include all of the following;
  - 1. Indicate profiles, sizes, and spacing locations of structural members.
  - 2. Cross-reference all shop drawing detail references to contract document detail references.

3. Secure all field measurements as necessary to complete this work.
- E. Manufacturer's Certificate: Submit all certifications of physical and chemical properties of materials as specified below in Article titled QUALITY ASSURANCE.
  1. Certify that wood products supplied for rough carpentry meet or exceed specified requirements, including specified moisture content.

#### **1.4 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies, refer to pertinent sections of Division 01 and CBC Chapter 17.
- B. All tests shall be performed by a recognized testing agency as specified in pertinent sections of Division 01.
- C. Inspection of fabricators is required per CBC 1704.2 unless fabricator is registered and approved by the building official. Wood product quality standards:
  1. All wood products to comply with article REFERENCES.
  2. Factory-mark each piece of lumber and sheathing with type, grade, mill, and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
  3. Sheathing panels to be marked by APA (The Engineered Wood Association).
- D. End-Jointed lumber shall not be used.
- E. Hardware and engineered wood products shall have current ICC ES Evaluation/research reports that are equivalent to products specified.
- F. Employ competent workers experienced in work of the types specified and required.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Comply with pertinent requirements of Division 01.
- B. Delivery: Time delivery and installation of carpentry products to avoid delaying other trades whose work is dependent on or affected by this section and to comply with moisture content, protection and storage requirements.
- C. Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and sheathing panels to prevent deformation and provide air circulation within stacks.
  1. Store materials for which a maximum moisture content is specified only in areas where relative humidity has been reduced to a level where specified moisture content can be maintained.
  2. Handle and store materials above ground to prevent damage, contamination, or accumulation of dirt or foreign materials.



3. Provide special protection for horizontal sheathing panels. Deformation of panels due to moisture is not acceptable.

## **1.6 PROJECT/SITE CONDITIONS**

- A. Verify all conditions at project site affecting the work; work to field dimensions as required. Coordinate carpentry installation with size, location, and installation of service utilities.
- B. Sequence rough carpentry installation activities to allow sufficient time for:
  1. Review of all submittals, including machine-driven nail sample submittals.
  2. Indicate submittal review, procurement, and testing activities in the project schedule prior to the start of installation. Installation durations shall be based on hand-nailed installation methods specified.
  3. Attainment of specified maximum lumber moisture content.

## **PART 2 - PRODUCTS**

### **2.1 DIMENSIONED LUMBER**

- A. General
  1. Size per industry standards for nominal sizes shown; S4S (sanded four sides).
  2. Warped/twisted and excessively checked members shall not be used regardless of grade marks.
  3. At the Contractor's option, engineered lumber of equivalent size and material properties may be substituted for solid sawn lumber where material is difficult to source due to length, availability, etc. Submit proposed substitution to Engineer for review prior to purchasing materials.
- B. Moisture content of framing:
  1. All lumber to be maximum 19% at time of fastener installation, except 3x and 4x studs may be 25% at time of sheathing panel nailing. All lumber to be maximum 19% at time of close-in, unless noted otherwise.
  2. The Owner's Testing Laboratory will test for moisture content prior to commencement of close-in.
  3. The Contractor shall recognize that excessive shrinkage of lumber results from excess moisture content at the time of installation. The Contractor will compensate for use of such lumber by waiting for acceptable moisture content before close in and/or by replacing/repairing lumber that has sagged, twisted, or warped prior to close in.
  4. Deviation from this specification would require structural redesign of connections and fasteners.

- C. Sills/ledgers on concrete or masonry: No. 2 pressure treated Douglas Fir and as called for on the drawings.
- D. Interior structural framing shall be Douglas Fir (D.F.) with grades as noted below, unless otherwise specified on the drawings. All grades are per WCLIB standard grading rules.
  - 1. All permanently exposed (interior or protected from weather) framing shall be select structural grade with no box heart.
  - 2. Except per 1 above, unless noted otherwise, minimum grades are:
    - a. Floor/roof joists/rafters (2x) and 2x8 & larger studs: D.F. No. 2
    - b. 2x4 and 2x6 studs and plates: D.F. No. 2
    - c. 4x and larger: D.F. No. 1
    - d. Blocking: D.F. No. 2
    - e. 6x8 and larger posts and beams may be SGL/CGL per below unless noted otherwise on the drawings.
- E. Framing not otherwise shown or specified: Douglas Fir construction grade per WCLIB paragraphs applicable to uses and sizes required.

## 2.2 MANUFACTURED LUMBER

- A. Laminated Veneer Lumber (LVL): for use as joists, beams, blocking, or studs when so noted on the drawings. Conform to ICC AC 47. Minimum  $F_b = 2,600$  PSI. Minimum  $E = 2,000,000$  PSI. Acceptable products:
  - 1. "Microllam LVL" by Trus Joist, ICC ESR-1387
  - 2. "Redlam LVL" by RedBuilt, ICC ESR-2993
  - 3. Approved equal
- B. Laminated Strand Lumber (LSL): for use as blocking (flat or vertical) or rim joist when used with I-joist or LVL, when so noted on the drawings. Conform to ICC AC 124. Minimum  $F_b = 1,700$  PSI. Minimum  $E = 1,300,000$  PSI. Acceptable products:
  - 1. "Timberstrand LSL" by Trus Joist, ICC ESR-1387
  - 2. "Redlam LSL" by Redbuilt, ICC ESR-1387
  - 3. Approved equal
- C. Parallel Strand Lumber (PSL): for use as beams and posts when so noted on the drawings. Conform to ICC AC 47. Minimum material properties for beams:  $E = 2,000,000$  psi;  $F_b = 2,900$  psi;  $F_c = 2,900$  psi (parallel);  $F_v = 290$  psi. Minimum material properties for posts:  $E = 1,800,000$  psi;  $F_b = 2,400$  psi;  $F_c = 2,500$  psi (parallel);  $F_v = 190$  psi. Acceptable products:

1. "Parallam PSL" by Trus Joist, ICC ESR-1387
2. Approved equal

### **2.3 MANUFACTURED STRUCTURAL PANELS**

- A. Plywood: Structural sheathing shall conform to product standard PS-1 or PS-2. All panels shall have an exterior exposure rating and bear the trademark of the Engineering Wood Association (APA) or other qualified agency. Grades shall be as required on the drawings.
- B. Oriented Strand Board (OSB): All structural OSB shall be grade marked by a qualified agency for conformance with Product Standard PS-2 and shall be fabricated with exterior glue. Grades shall be as required on the drawings.

### **2.4 TREATED WOOD:**

- A. Treated Lumber and Plywood: Comply with requirements of AWWA Standard U1. See Standard U1 for "Use Category" designations. Do not provide higher Use Category lumber than that specified. Maximum moisture content shall be the same as required for "dimensioned lumber" as specified above.
- B. Preservative Treated Lumber
  1. General
    - a. Preservatives shall be waterborne. Preservative retention rate shall be as required per AWWA Standards U1 & T1. Lumber shall be Douglas Fir No. 2 (or better). Cut faces of treated wood shall be brush treated (two complete applications) prior to installation.
    - b. Lumber less than 8 inches above grade and lumber less than 6 inches above exterior hard-surface flatwork shall be treated.
    - c. Each piece of wood shall be stamped by the wood preservative applicator to identify its treatment and preservative retention.
  2. Lumber at interior, non-weather exposed locations installed adjacent to concrete or masonry shall be Use Category UC2. Examples include sill plates & ledgers and lumber in contact with roofing, flashing, or water proofing.
  3. Lumber at exterior locations, not in contact with soil/ground, shall be Use Category UC3B. Examples include Douglas Fir decking and deck framing.
  4. Lumber in contact with soil/ground shall be Use Category UC4A. Examples include timber retaining walls.
  5. Poles, posts, and sheathing panels shall be treated as recommended by AWWA Standard U1 per use and exposure.

6. Maximum Volatile Organic Compound (VOC) content of field-applied preservative shall meet local air quality standards and the California Green Building Code. Provide either of the following:
  - a. Copper Azole (CA-B) per ICC-ES AC143.
  - b. Alkaline/Copper/Quaternary (ACQ).

## 2.5 FASTENERS AND ACCESSORIES

### A. General requirements for fasteners:

1. Fasteners shall be of adequate size, spacing, and number to resist design loads under intended use, and types shall be appropriate for the materials or conditions for which used.
2. Provide washers, pre-drilling, etc. as required for proper installation and to prevent damage to framing.
3. Fasteners shall be hot-dip galvanized (ASTM A153), mechanically galvanized (ASTM B695 class 55 minimum), stainless steel (type 303, 304, 305, or 316), silicon bronze, or copper by approved methods for the following applications:
  - a. Exterior, exposed use.
  - b. In contact with preservative or fire-retardant treated wood.
4. Fasteners in moist corrosive atmosphere to be of stainless steel (type 303, 304, 305, or 316).
5. Where the retention level of ACQ or MCQ preservative is greater than 0.40 pcf, CBA-A preservative is greater than 0.41 pcf, or CA-B preservative is greater than 0.21 pcf, provide stainless steel fasteners (type 303, 304, 305, or 316).
6. All fasteners specified by manufacturer shall be installed in framing hardware, unless noted otherwise.

### B. Nails and nailing not otherwise shown or specified:

1. Comply with requirements of governing building code.
2. For securing materials to hardened concrete or masonry provide hardened steel masonry nails or Simpson Strong-Tie "Titen" screws.
3. For framing and general woodwork: Common bright wire nails (not box nails) per ASTM F1667. 16d cement coated sinker nails may be used in lieu of common nails for framing, where noted on the drawings.
4. Nails for sheathing panels shall be of common wire with full round heads and shall be of sufficient length to fully develop the nails.

5. Machine-driven nails of all types must comply with the requirements of this section. All proposed nails shall match diameter and penetration of specified nails.
  6. Staples shall conform to length and gauges specified and shall be installed to match specified patterns and spacing.
  7. Powder-Driven Pins (PDP): Use only as approved by the Architect/Engineer; operators shall be qualified.
- C. Bolts: Malleable iron washers or steel plate washers, unless otherwise shown, shall be provided under all bolt heads and nuts.
1. Machine Bolts: ASTM A307 and ANSI/ASME B18.2.1, standard semi-finished machine bolts as shown or required. Nuts shall be standard size unless noted otherwise and shall be per ASTM A563.
  2. Anchor bolts or threaded rod anchors shall conform to ASTM F1554, ASTM A307, or ASTM A36. Anchor bolts shall be headed or end in two nuts tightened against one another, unless noted otherwise. Provide embedded plate washer as indicated on drawings. No upset threads allowed. No L or J bolts allowed.
- D. Lag screws: Standard hex lag screws per ANSI/ASME B18.2.1.
- E. Wood screws: Standard wood screws per ANSI/ASME B18.6.1.
- F. Powder-Driven Pins (PDP): Hilti X-CP72, ICC ESR-2379; Simpson PDPWL-300 MG, ICC ESR-2138.
- G. Framing hardware: Fabricated sheet metal timber framing connectors shall be manufactured from painted or galvanized G90 steel by Simpson Strong-Tie (connectors specified on drawings are per Simpson Strong Tie, USP Lumber Connectors, or approved equivalent. Connectors shall be at least 16 gauge material, (1/8 inch plate materials where welded), unless otherwise noted, punched for nailing. All heavy hardware to be fabricated from A36 steel per Division 05, Metals. All hardware intended for exterior exposed use shall be galvanized per G185 ASTM A653 or stainless steel.
1. For contact with preservative or fire-retardant treated wood, provide minimum G185 galvanizing per ASTM A653.
  2. Nails and nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. Nails to be used with framing accessories are subject to the requirements specified in this Section for fasteners and anchors.

## 2.6 SOURCE QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform testing for moisture content of all lumber at time of fastener installation.
- B. The Testing Agency will submit reports as specified in Division 01.

## PART 3 - EXECUTION

### 3.1 REQUIREMENTS FOR STRUCTURAL FRAMING

#### A. General

1. Refer to drawings for layouts, notes and details, provide framing as required; comply with governing building code requirements.
2. Provide framing to achieve true alignments as surfaces receiving finish materials.
3. It shall be the responsibility of the Contractor to provide and install all wood blocking, furring strips, or grounds detailed or required to provide anchorage for all finishes, accessories, fixtures, etc. as required to complete all work. All blocking and/or backing shall be securely bolted or otherwise anchored in place.
4. Contractor shall be responsible for layout of anchor bolts, and other hardware embedded in concrete when placed by other trades.
5. Provide and install all structural framing, blocking, fasteners, brackets, clips, etc. as required to complete work specified in the Construction Documents.

#### B. Framing

1. Sill Plates and Ledgers:
  - a. Sill plates and ledgers on concrete shall be anchored with bolts, unless noted otherwise, shall have full bearing on concrete, and shall be placed for sheathing panel nailing as indicated. All bolt nuts shall be provided with a cut plate steel washer for bearing on wood.
  - b. Provide a minimum of two sill anchor bolts per sill piece with a bolt no less than 4 ½" and no more than 12" from the end of the sill. Bolts to be 5/8" diameter x 12" (18" at curb) long at 48" on centers, unless otherwise shown or noted. Provide additional anchor bolts each side of a notch or hole, as per a typical plate splice, where notch or hole is in excess of 1/3 the plate width. At shear walls, provide a plate washer 3" x 3" x 0.229" minimum between the sill and nut at anchor bolts. Plate washer to extend within ½ inch of the structural wall sheathing. Offset and/or stagger anchor bolts, or provide larger plate washer as required.
  - c. Anchor bolt holes in sill plates or ledgers shall be 1/16" maximum larger than anchor bolt.
2. Stud Walls and Framing:

- a. Cut studs and posts with square ends, unless otherwise shown or noted. All posts and beams shall be "cut to bear" unless otherwise detailed.
  - b. All studs in walls shall be placed with the shortest dimension parallel to the run of the wall. Bearing studs shall extend full height to be the supporting framing as shown; non-bearing studs shall extend to the supporting framing.
  - c. Provide double studs on each side of all openings, unless shown or noted otherwise.
  - d. All openings in stud walls and partitions shall be framed with headers across the top, as shown, with a minimum size (6" nominal depth x stud width) resting on short cripple studs, and as shown on the drawings.
  - e. All stud partitions and walls shall have horizontal solid blocking not less than 2x and of the same width as the stud, fitted and nailed into the studs at mid-height of stud, for studs over 8 feet in height, except as otherwise shown or specified. This blocking shall be so spaced that there shall be no concealed air spaces greater than eight feet in any dimension.
  - f. Stud partitions containing plumbing, heating or other pipes shall be so framed as to give proper clearance for piping. Plumbing, heating and vent pipes exceeding 1-1/2" in inside diameter shall not be placed in partitions used as bearing or shear walls unless completely furred clear of the wall. No notching shall be allowed. Pipes shall be placed in the center of the plate using a neat bored hole and the plates shall be strapped on each side with 3" x 36" x 14 gauge steel punched for 10d nails 3" on center, staggered, or as shown on the drawings.
3. Top Plates
- a. Top plates shall be double, set single. Corners where stud wall or partitions meet shall be framed with studs on all surfaces and blocking to form a "rigid" corner with nailing for all corners. Double top plates shall be lapped at corners. Lap splices and nailing per the drawings.
4. Floor, Roof and Ceiling Framing
- a. Joists and beams shall be accurately aligned and the position and spacing of all joists and beams shall be as shown and be coordinated with other framing and to other trades prior to actual construction.
  - b. Place all joists and beams with crown up. Cantilevered joists and beams shall be placed with the crown down.
  - c. Cutting of wood girders, beams or joists for electrical and mechanical lines shall be limited to cuts and bored holes not deeper than 1/5 of the beam depth from the top and located not farther from the support than three times the beam depth and not less than the beam depth. Cuts in excess of this, or single bored holes with a diameter of more than 1" are not permitted without special provisions for framing the beams. Location of all cuts in framing shall receive the prior review of the Architect/Engineer.

- d. Provide vent holes in rafters and/or blocking as shown and/or directed by the Architect.

### 3.2 STRUCTURAL SHEATHING

#### A. General

1. Sheathing nailing shall be as required on the drawings. Do not overdrive (Do not break skin of sheathing face sheet). Over driving will be cause for rejection.
2. Form sheathing may be re-used for concealed sheathing provided the lumber at the time of re-use is approved by the Architect, meets with the framing grade requirements specified herein, is in good condition, and is thoroughly cleaned with all nails removed.
3. Pneumatic nailing devices shall be adjustable so that nail heads do not penetrate skin of sheathing. Contractor shall submit equipment and nails for review prior to use. Refer to PART 2 for other nailing requirements.

- B. Roof and Floor Sheathing: Except "Panelized Roofs", lay with face grain perpendicular to roof rafters, roof trusses or floor joists. Stagger sheets. Block all unsupported sheet edges with 2x material unless noted otherwise.

- C. Wall Sheathing: Lay with face grain either parallel or perpendicular to studs. Exposed bottom edges shall be sealed as recommended by manufacturer. Block all unsupported sheet edges with 2x materials unless noted otherwise.

### 3.3 ROUGH HARDWARE

- A. General: Nails, spikes, screws, fabricated sheet metal anchors, ties, hangers and any other materials shown or required for the attachment of wood to concrete and wood to steel and wood to wood shall be furnished and installed as part of this work.

- B. Framing Nailing: All framing nailing shall conform to minimum requirements of the Building Code, and with details shown on the drawing.

C. Bolts, Lag Screws and Washers:

1. Bolts in wood shall be machine bolts unless otherwise noted and shall be of such length that the bearing length of the treads does not exceed  $\frac{1}{4}$  of the full bearing length in the member holding the treads. Bolt holes in wood shall be  $\frac{1}{32}$ " oversized. Bolt holes for sill plates may be  $\frac{1}{16}$ " maximum oversize. Holes in steel shall be  $\frac{1}{16}$ " oversize. See Section 3.1 for anchor bolts at sill plates and ledgers.
2. Provide square plate or malleable iron washer and nut at head where bearing is against wood; cut washer under nut where it is against steel. Washer will not be required under head of carriage bolts. Provide malleable iron washers where exposed.
3. All nuts shall be tightened when placed and retightened at completion of the job or immediately before closing with final construction.



4. Lag screws shall be screwed (not driven) into place. Drill pilot hole to 70% of shank diameter. Drill clearance hole to full shank diameter and depth of unthreaded screw length.
- D. Wood Screws: Minimum penetration is 10 diameters unless noted otherwise. Where fastening hardwood timber species or where wood tends to split, provide pilot hole 70% of screw shank diameter.

### **3.4 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD**

- A. Coordinate installation of wood decking, metal-web wood joists, glued-laminated wood construction, shop-fabricated wood trusses, and wood I- joists.
- B. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members. Fasten curbs corner-to-corner and to rafters with framing connectors configured for this application.
- C. Blocking:
1. Provide fire blocking at locations and spacing's as required by CBC Chapter 7. Locate other blocking, supplementary framing, backing plates and bracing to facilitate installation of finish materials, fixtures, equipment, services, accessories, and trim requiring attachment and support.
  2. Solid block joists and rafters over all supports with blocking of the same size and material as the joist or rafter.
- D. Furring:
1. Nominal 1 inch x 3 inch minimum, continuous and spaced at 16 inches on center, maximum.
  2. Install plumb, rigid, and level. Shim where necessary to provide a true, even plane suitable to receive the finish required.
  3. Attach to concrete and masonry as shown in the contract drawings.
- E. Bridging: Use 2 inch solid cross bridging. Nail bottom ends of bridging only after sheathing has been nailed.
- F. Install accessory items not otherwise set under other sections; after completion of painting and other finishing work; in locations shown or directed by the Architect. Set items plumb, level, and secure using appropriate fastening as applicable.

### **3.5 FIELD APPLIED WOOD TREATMENT**

- A. Field treat all end cuts and holes in preservative treated materials per PART 2.
- B. Apply two brush coats; or full-immersion dip not less than 15 minutes; or as required to thoroughly saturate all surfaces after cutting.

- C. Air dry 2-hours minimum before installation.

### **3.6 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum. Provide framed substrates meeting requirements for application of finishes specified in other sections.
- D. Exposed surfaces shall be free from dents and tool marks, unsanded rough or torn faces and corners, and other defects.

### **3.7 FIELD QUALITY CONTROL**

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following tests and submit reports as specified in Division 01:
  - 1. Moisture content of all lumber at time of close-in.
  - 2. Periodic special inspection of nailing, bolting, and other fastening within the seismic-force-resisting system including shear walls, wood diaphragms, etc. per CBC Section 1705.12.2, excluding systems with sheathing nailing spacing greater than 4" on center.
  - 3. Special inspection of high load diaphragms per CBC Section 1705.5.1 where designated on documents.

### **3.8 ADJUSTING**

- A. Replace all defective work at Contractor's expense.
- B. Replace defective or damaged work with conforming work.
- C. Correct defects using means that will not injure the materials.
- D. Replace defective or damaged work which cannot be corrected in the field with new work, or return defective items to the shop for repair.
- E. Repair or replace framing lumber sagged, twisted or warped due to shrinkage from excessive moisture content at time of installation, or from other causes.
- F. Adjust to meet specified tolerances.
- G. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.
- H. Pay expenses incurred by Owner for Architect/Engineer's costs for (re-)design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

- I. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

### **3.9 CLEANING AND PROTECTION**

- A. Clean all surfaces upon completion of erection, leave free of grime and dirt. Remove unused materials, tools, equipment, and debris from the premises and leave surfaces broomed clean.
- B. Waste Disposal: Comply with the requirements of pertinent sections of Division 01 specifying cleaning and disposal.
  1. Comply with applicable regulations.
  2. Do not burn scrap on project site.
  3. Do not burn scraps that have been pressure treated.
  4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- C. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- D. Prevent sawdust and wood shavings from entering the storm drainage system.
- E. Protect work from damage by subsequent operations.

**END OF SECTION**

## **SECTION 06 20 00 - FINISH CARPENTRY**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Finish carpentry items.
- B. Wood casings and moldings.
- C. Reinstallation of interior tongue and groove (T&G) wood siding as indicated.
- D. Hardware and attachment accessories.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials
- C. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- D. Section 06 41 00 - Architectural Wood Casework: Shop fabricated custom cabinet work.
- E. Section 06 41 00: Architectural Wood Casework: Cabinet hardware.
- F. Section 09 90 00 - Interior Painting

#### **1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  - 2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.

3. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.
  4. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.
- B. Product Data:
1. Provide instructions for attachment hardware and finish hardware.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
  2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
  3. Include certification program label.
- D. Samples: Submit two samples of wood trim 12 inch long.
- E. Forest Stewardship Council (FSC) Certified Products:
1. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
  2. Forest Certification: Provide components made with not less than 50 percent of wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

### **1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- B. Protect from moisture damage.
- C. Handle materials and products to prevent damage to edges, ends, or surfaces.

## **PART 2 PRODUCTS**

### **2.01 FINISH CARPENTRY ITEMS**

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Interior Woodwork Items:
  - 1. Tongue and Groove (T&G) siding: Salvaged and selected for reinstallation.
  - 2. Tongue and Groove (T&G) siding: Match existing in stain and finish
  - 3. Interior: 3 inch base. Species, stain and transparent finish to match existing T&G wood finish.
  - 4. Interior redwood trim around skylights to receive stain and transparent finish:.
  - 5. Interior redwood trim around doors
  - 6. Interior redwood trim at gypsum ceiling soffit edge
  - 7. Interior and exterior redwood finish wrap over PSL and beam

### **2.02 WOOD-BASED COMPONENTS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Composite Wood Products.

### **2.03 LUMBER MATERIALS**

- A. Softwood Lumber: Douglas Fir or Redwood to match existing finish carpentry species, plain or resawn texture to match existing materials sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
- B. Hardwood Lumber: Ash species, smooth sawn, maximum moisture content of 6 percent for field applied opaque finish..

### **2.04 FASTENINGS**

- A. Fasteners: Of size, type and finish to suit application and match existing conditions.

### **2.05 ACCESSORIES**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.
- B. Adhesive: Type recommended by fabricator to suit application.
- C. Lumber for Shimming and Blocking: Softwood lumber of Douglas Fir species.

- D. Primer: Alkyd primer sealer.
- E. Wood Filler: Oil base, tinted to match surface finish color.

## **2.06 SITE FINISHING MATERIALS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Architectural Paints and Coatings including aerosol paint and coating systems.
- B. Stain, Shellac, Varnish, and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

## **2.07 FABRICATION**

- A. Shop assemble work for delivery to site, permitting 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.

## **2.08 SHOP FINISHING**

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
  - 1. Transparent:
    - a. System - 1, Lacquer, Nitrocellulose.
    - b. Stain: As selected by Architect.
    - c. Sheen: Flat.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

### **3.02 INSTALLATION**

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Install hardware in accordance with manufacturer's written instructions.

### **3.03 PREPARATION FOR SITE FINISHING**

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 90 00 - Painting.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

### **3.04 TOLERANCES**

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

**END OF SECTION**



## **SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Section Includes: Plastic laminated faced casework and associated wood trim.
- B. Upholstered bench with roll out storage
- C. Adjustable height service and reference desk
- D. Countertops.
- E. Cabinet hardware.
- F. Fixed resilient counterotp with vertical dividers
- G. Restroom undersink casework

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- C. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- D. Section 09 90 00 - Painting: For back priming and finish painting.
- E. Division 22 - Plumbing: Provision of sinks and other plumbing fixtures and fittings for elements located in countertops including rough-in and connection to such fixtures.
- F. Division 26 - Electrical: Provision of electrical fixtures and fittings for elements located in casework including rough-in and connection to such fixtures.

#### **1.03 REFERENCE STANDARDS**

- A. ANSI - American National Standards Institute
  - 1. A208.2 - Medium Density Fiberboard (MDF) for Interior Applications.
  - 2. B18.6.1 - Screws, Wood (Slotted).
- B. BHMA - Builders Hardware Manufacturers Association
  - 1. A156.9 - Cabinet Hardware.
  - 2. A156.11 - Cabinet Locks.

- C. CALGreen - California Green Building Standards, 2013 Edition.
- D. EPA - Environmental Protection Agency
  - 1. 1. Method 24 - Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings
- E. FSC - Forest Stewardship Council
  - 1. STD-01-001 - FSC Principles and Criteria for Forest Stewardship.
- F. NFPA - National Fire Protection Association
  - 1. 260 -Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture.
- G. UFAC - Upholstered Furniture Action Council
- H. WI - Woodwork Institute.
- I. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- J. BHMA A156.9 - Cabinet Hardware; 2020.
- K. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.
- L. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

#### 1.04 DEFINITIONS

- A. Exposed Portions - All Grades: Surfaces visible when doors and drawers are closed; underside of bottoms of cabinets over 4 feet above finished floor; cabinet tops under 6 feet above finished floor; visible front edges of web frames, ends, divisions, tops, shelves, and hanging stiles
  - 1. Where open shelves are indicated, tops and bottoms of adjustable shelves and inside surfaces of shelving units shall be considered as exposed.
- B. Semi-Exposed Portions: Shelves behind cabinet doors; divisions; interior face of ends, backs, and bottoms; drawer sides, subfronts, backs, and bottoms; underside of bottoms of cabinets between 2-1/2 and 4 feet above finished floor; interior faces of hinged doors; and all rooms designated as storage, janitor, closet, or utility.
- C. Concealed Portions: Toe space intended to receive resilient base; sleepers, web frames, stretchers, and solid sub-tops; security panels; underside of bottoms of cabinets less than 2-1/2 feet above finished floor; flat tops of cabinets 6 feet or more above finished floor except if visible from upper building level; 3 non-visible edges of adjustable shelves; underside of countertops, knee spaces, and drawer aprons; faces of cabinet ends of

adjoining units that butt together.

### 1.05 SUBMITTALS

- A. CALGreen Submittals: Provide the following:
1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.
  3. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.
  4. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.
- B. Product Data
1. Submit manufacturer's product data for each type of product and process specified and incorporated into items of architectural woodwork during fabrication, finishing, and installation, including hardware.
  2. Submit manufacturer's written installation instructions for pre-fabricated casework items.
- C. Shop Drawings: Submit shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, seismic anchorage and other components.
1. Show details : 1-1/2" inch to 1 foot .
  2. Show locations and sizes of furring and blocking, including concealed backing and reinforcing specified in other Sections.
  3. Show locations and sizes of cutouts and holes for plumbing fixtures, electrical devices, faucets, grommets, and other items installed in casework.
  4. Apply WI-certified compliance label to first page of Shop Drawings
- D. Quality Control Submittals
1. Certificates: Submit WI compliance certificates indicating that woodwork meets requirements of grades specified.

2. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and Cities, and other information specified.
- E. Samples: .
1. Submit actual sample items of exposed pulls, hinges, shelf standards, and locksets, demonstrating hardware and accessories design, quality, and finish
  2. Lumber with transparent finish for species and cut
  3. Plastic laminates, 8 by 10 inches, for each type, color, pattern and surface finish
  4. Solid surface materials, 6 inches square, for each type, color, pattern and surface finish
  5. Upholstered cushion materials for type, color and pattern of fabric material

#### **1.06 QUALITY ASSURANCE**

- A. Qualifications
1. Fabricator: Firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.
  2. Installer: Arrange for interior architectural woodwork installation by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this Project.
- B. Quality Standard: Except as otherwise indicated, comply with WI for grades of interior architectural woodwork, construction, finishes and other requirements.
- C. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Acceptance at Site: Do not deliver casework until painting and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. Protect units from moisture damage.

#### **1.08 FIELD CONDITIONS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

- B. Environmental Requirements: Do not deliver or install casework until wet-work is completed and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- C. Field Measurements: Where casework is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Verify locations of concealed framing, backing, reinforcements, and furring that support casework by accurate field measurements before being enclosed. Record measurements on final shop drawings.
  - 2. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating casework without field measurements. Provide allowance for trimming at site and coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

## **PART 2 PRODUCTS**

### **2.01 CABINETS**

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Cabinets at Service Desk; Restroom Cabinets; , Upholstered Bench with Roll out Storage Bins:
  - 1. Finish - Exposed Exterior Surfaces: Decorative laminate.
  - 2. Finish - Exposed Interior Surfaces: Decorative laminate.
  - 3. Finish - Semi-Exposed Surfaces: Decorative laminate
  - 4. Finish - Concealed Surfaces: Manufacturer's option.
  - 5. Door and Drawer Front Edge Profiles: Square edge with thick applied band.
  - 6. Door and Drawer Front Retention Profiles: Fixed panel.
  - 7. Casework Construction Type: Type A - Frameless.
  - 8. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay.
  - 9. Grained Face Layout for Cabinet and Door Fronts, including wood pattern plastic laminate: Flush panel.
    - a. Premium Grade:

- 1) Provide vertical run and match for doors, drawer fronts and false fronts within each cabinet unit.
  - 2) Provide well-matched doors, drawer fronts and false fronts across multiple cabinet faces in one elevation.
10. Adjustable Shelf Loading: 50 lbs. per sq. ft.
- a. Deflection: L/144.
11. Drawer Side Construction: Manufacturer's option.
12. Drawer Bottom: Plastic Laminate; No melamine
13. Drawer Sides and Back: Solid hardwood lumber.
14. Drawer Construction Technique: As recommended by fabricator.

## **2.02 UPHOLSTERY**

- A. Upholstered Bench and rolling storage: Full upholstered padded seat with rear wood lip; polyurethane fabric with polyester backing, advanced soil and stain protection; 54 inches wide; exceed 100,000 double rubs, passes CATB 117, Class I NFPA 260, Class I UFAC.
1. Polyurethane Foam Cushioning: Of shape, sizes and densities specified, and with internal wood frame where required. Foam to meet flame spread requirements of authorities having jurisdiction.
  2. Polyester padding
  3. Waterproof fabric liner.
  4. Upholstery Fabric:
    - a. Basis of Design Manufacturer: Designtex; Silicone Element.
    - b. Color: Tangerine
    - c. Provide Scotchgard treatment

## **2.03 WOOD-BASED COMPONENTS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Composite Wood Products.
- B. General
1. Material Grade: Provide materials that comply with requirements of the WI quality standard for each type of woodwork and quality grade indicated, unless otherwise indicated.

2. Lumber and Plywood: Kiln-dry to equilibrium moisture content suitable for fabrication in shop and use intended.
  3. Wood products shall be FSC-certified.
- C. Lumber, Solid Stock
1. Exposed and Semi-Exposed Portions for Transparent Finish: Quartered or rift cut Ash
  2. Concealed Portions: Birch, paint grade.
- D. Plywood
1. At Wet Area Countertops: Marine plywood, 3/4-inch thick.
- E. Medium Density Fiberboard (MDF)
1. ANSI A208.2, 3/4-inch thick, paint grade, with low VOC/ formaldehyde-free.
  2. Product: As manufactured by Roseburg -Medite Corporation, Inc., "Medex", or equal
- F. Wood fabricated from old growth timber is not permitted.

## **2.04 LAMINATE MATERIALS**

- A. Manufacturers:
1. Wilsonart LLC; Standard HPL: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
  2. or equal.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Provide specific types as indicated.
1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, Color to be selected by Architect, finish as indicated.
  2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, Color to be selected by Architect color, finish as indicated.
  3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, through color, Color to be selected by Architect color, finish as indicated.
  4. Edges: ABS T-molding matching laminate color, pattern, and finish.
  5. Service Desk: Wilsonart, Fusion Maple 7909, Fine Velvet
  6. Restrooms Undersink Casework: Pionite,, Love Letter, AW3000SD, Textured, Suede.

7. Bench and Rolling Storage : Fusion Maple 7909, Fine Velvet

## 2.05 COUNTERTOPS

- A. Solid Surfacing Materials: Engineered quartz materials for countertops at service desk, and restroom lavatory, including backsplash.
  1. Service Desk: Corian Quartz, 3 CM thickness, Color: " Snow Flurry". Mitred edges.
  2. Restrooms: Corian Quartz, 3 CM thickness, Color: "Snow Flurry". Mitered edges.
- B. Resilient Countertops: Plywood substrate covered with resilient linoleum sheet, adhered with manufacturer's recommended adhesive, edge-banded with hardwood trim.
  1. Basis-of-design: Forbo Marmoleum, 2.5 mm thickness.
  2. Color: Mushroom 4176

## 2.06 ACCESSORIES

- A. General: Provide accessory materials associated with architectural cabinets.
- B. Adhesive: Type recommended by fabricator to suit application. Do not use adhesives that contain urea formaldehyde.
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Cable Tray: For sections in lengths at service desk and fixed countertop
  1. Product: Doug Mockett & Co. 'WM2A', J-shaped plastic wire manager, or equal
  2. Size: 3-1/4" inches high by 1" wide. Provide section in lengths of the countertop
  3. Color: Black.
- G. Grommets: For cable passage through solid surface and resilient countertops:
  1. Product: Doug Mockett & Co, Inc. Metal desk grommet - 2-3/8" 'MM4' cap & liner set or equal
  2. Finish: black chrome, satin chrome, satin nickel. To be selected by Architect



## 2.07 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
- C. Drawer and Door Pulls: Round top drawer pull, die cast zinc with satin nickel finish, size: 6 11/16" long, 13/32" diameter, 1 13/32" projection.
  - 1. Product: DP128 manufactured by Doug Mockett & Co, or equal
  - 2. Color: Satin Nickel, Satin Stainless Steel, Finish to be selected by Architect
- D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish per Owner's direction. All upper and lower cabinets to be lockable at Service and Reference Desk area
- E. Catches: Magnetic.
- F. Drawer Slides:
  - 1. Type: Full extension.
  - 2. Static Load Capacity: Heavy Duty grade.
  - 3. Mounting: Bottom mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.
  - 6. Manufacturers:
    - a. Under-mounted, Heavy Duty Grade 1HD-100, full-extension type, zinc-plated steel ball-bearing slides. Basis-of-design product: Accuride "Easy-Close" Model 3132EC. Weight capacity: 100 pounds.
- G. Hinges: European style concealed self-closing type, steel with polished finish.
  - 1. Manufacturers:
    - a. Grass America Inc; Institutional Hinges: [www.grassusa.com/#sle](http://www.grassusa.com/#sle).
    - b. Hettich America, LP: [www.hettich.com/#sle](http://www.hettich.com/#sle).
    - c. Blum, Inc: [www.blum.com/#sle](http://www.blum.com/#sle).

- H. Electric DeskSystem: Adjustable height; base set, dimensions as indicated, available in Silver, Charcoal and White; solid surface countertops as indicated on the Drawings.
  - 1. Manufacturers:
    - a. ErgoDirect.com "Workrite Sierra HX" or equal.
- I. Computer Monitor Support Slides: At Service and Reference Desk area
  - 1. Product: Ergotron: LX Dual Stacking Arm; 45-492-216. [www. ergotron.com](http://www.ergotron.com), or equal.
  - 2. Finishes: White
- J. Casters: 3-1/8" high, plastic, two-wheel swivel caster with brake and mounting plate
  - 1. Product: Doug Mockett & Co, Model CA42PA 'small twin-wheel caster' or equal
  - 2. Finishes: As selected by Architect from manufacturer's full range.

## 2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
  - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
  - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.

## 2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:
  - a. Sheen: Flat.
  - b. Products:
    - 1) Sherwin-Williams Sayerlack Premium Polyurethane Clear Topcoat, TZL71 Series, AWI Finishing System 11.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

#### **3.02 INSTALLATION**

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinets to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Solid-Surfacing material Countertops
  1. Installation Tolerances:
    - a. Variation from Level: Do not exceed 1/8 inch in 96 inches.
    - b. Variation in Joint Width: Do not vary joint thickness more than one-fourth of nominal joint width.
    - c. Variation in Plane at Joints (Lipping): Do not exceed 1/64-inch difference between planes of adjacent units.
    - d. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64-inch difference between edges of adjacent units, where edge line continues across joint.

2. Install countertops over plywood subtops with full spread of water-cleanable epoxy adhesive.
3. Do not cut solid-surfacing material in field unless otherwise indicated. If countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
4. Set solid-surfacing material to comply with requirements indicated. Shim and adjust to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances. Install anchors and other attachments indicated or necessary to secure countertops in place.
5. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
6. Install backsplashes and end splashes by adhering to wall with water-cleanable epoxy adhesive. Leave 1/16-inch gap between countertop and splashes for filling with sealant. Use temporary shims to ensure uniform spacing.
7. Apply sealant to joints and gaps specified for filling with sealant; comply with Section 07 92 00 - Joint Sealants. Remove temporary shims before applying sealant.

### **3.03 ADJUSTING**

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

### **3.04 CLEANING**

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

## **SECTION 07 21 00 - BUILDING INSULATION**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Batt insulation for exterior wall, ceiling, and roof construction required to replace existing batt insulation in areas impacted by new work.
- B. Sound attenuating batt insulation to replace or repair sound attenuating insulation in existing interior walls impacted by new work.
- C. Batt insulation in exterior ceiling and roof construction.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section
- B. Section 01 74 19 – Construction Waste Management and Disposal
- C. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- D. Section 07 92 00 - Joint Sealants: Acoustical sealants installed in partition assemblies.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

#### **1.04 SUBMITTALS**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

## **PART 2 PRODUCTS**

### **2.01 APPLICATIONS**

- A. Insulation in Wood Framed Walls: Batt insulation with integral vapor retarder at exterior walls.
- B. Insulation in Wood Framed Ceiling Structure: Batt insulation with no vapor retarder.
- C. Insulation in Wood Framed Roofs: Batt insulation with intergral vapor retarder.
- D. Insulation in Interior Partitions: Batt insulation with no vapor retarder.

### **2.02 BATT INSULATION MATERIALS**

- A. Where required to replace or repair existing thermal batt insulation in walls or ceilings impacted by new work. Glass fiber or mineral fiber batt insulation may be used, at Contractor's option.
- B. Where required in new interior walls or to replace or repair existing, sound-attenuating batt insulation in interior walls impacted by new work. Glass fiber or mineral fiber batt insulation may be used, at Contractor's option
- C. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit or mechanically attached as required to suit field conditons.
  - 1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
  - 2. Formaldehyde Content: Zero.
  - 3. Thickness: as required to completely fill stud or joist cavity.
  - 4. Facing: Aluminum foil, flame spread 25 rated; one side.
  - 5. Manufacturers:
    - a. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
    - c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
    - d. Owens Corning Corporation; Sound Attenuation Batt Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
- D. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit or mechanically attached as required to suit field conditons; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.

1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
2. Provide foil facing on one side, at locations indicated on drawings.
3. Thickness: as required to completely fill stud or joist cavity.
4. Manufacturers:
  - a. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
  - b. Knauf Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  - c. ROCKWOOL (ROXUL, Inc): [www.rockwool.com/#sle](http://www.rockwool.com/#sle).

## **2.03 ACCESSORIES**

- A. Insulation Fasteners: Lengths of unfinished, 13 gage, 0.072 inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

### **3.02 BATT INSTALLATION**

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Staple or nail facing flanges in place at maximum 6 inches on center.
- G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- H. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.
- I. Tape seal tears or cuts in vapor retarder.

- J. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
- K. Install sound attenuation batts before installing gypsum board. Fit insulation tightly in cavities, around cut openings, behind and around mechanical and electrical services within the plane of the insulation, and tight to items passing through partitions.

### **3.03 PROTECTION**

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**



## **SECTION 07 54 23 - THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Patch and repair of existing thermoplastic polyolefin (TPO) roofing membrane. Modifications to existing TPO roofing for new skylight, rooftop anchor, and guardrails. Matching existing TPO system.
- B. Install new roofing where removed for installation of new equipment and penetrations
- C. Flash in new curbs and penetrations.

#### **1.02 RELATED DOCUMENTS**

- A. The work performed in connection with any roofing system shall conform to current California Building Codes, Manufacturer's Specifications and the general provisions of this Contract, including General and Supplementary Conditions.

#### **1.03 PERFORMANCE REQUIREMENTS**

- A. General Performance: Installed membrane roofing and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7. Match existing TPO system to maintain warranty.
- D. Energy Performance: Provide roofing system with initial solar reflectance not less than 0.70 and emissivity not less than 0.75 when tested according to Cool Rating Council (CRRC). Match existing TPO system.
- E. Flashings and Fastening: Provide base flashings, perimeter flashings, details flashings, and component materials and installations techniques that comply with requirements and recommendations of the following:
  - 1. NRCA Roofing and Waterproofing Manual (Fifth Edition) for construction details and recommendations.
  - 2. SMACNA Architectural Sheet Metal Manual (Fifth Edition) for construction details.

#### **1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- A. Product Data Sheet: For each type of product required.
- B. Shop Drawings: For the roofing system to include plans, elevations, sections details, and attachments to other work necessary for the approval by the Engineer, including roof slopes, flashings and membrane terminations
- C. Roof plan showing membrane roofing and fastening spacings and patterns to include fastening patterns for corner, perimeter, field-of-roof locations.
- D. Samples for verification to include, but not limited to: Sheet roofing of color specified; Roof insulation; Walkway pads; Metal termination bars; Insulation fasteners of each type, length, and finish.
- E. Qualification Data: For qualified installer and manufacturer. Include letter from Manufacturer written for this Project indicating approval.
- F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" and submit evidence of compliance with performance requirements. Indicate that proposed system components are compatible.
- G. Warranties: Sample of special warranties.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data for roofing system to include maintenance manuals.
- B. Warranty: Sample of warranties.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

- E. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

### **1.07 PROJECT CONDITIONS**

- A. Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

### **1.08 QUALITY ASSURANCE**

- A. **Manufacturer Qualifications:** A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project. If the roof is under pre-existing warranty, all products used to be that of the same manufacturer.
- B. **Installer Qualifications:** A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. **Source Limitations:** Obtain components including roof insulation and fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.
- D. **Exterior Fire-Test Exposure:** ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. **Fire-Resistance Ratings:** Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

## **PART 2 - PRODUCTS**

### **2.01 TPO MEMBRANE ROOFING**

- A. **A. Fabric-Reinforced Thermoplastic Polyolefin Sheet per ASTM D 6878, fabric or scrim internally reinforced, uniform, flexible sheet.**
  - 1. The roof is under pre-existing warranty. All products used to be that of the same manufacturer. Obtain info from Owner and confirm manufacturer and roofing system components.
  - 2. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
    - a. Carlisle SynTec Incorporated.

- b. Custom Seal Roofing.
  - c. Firestone Building Products Company.GAF Materials Corporation.GenFlex Roofing Systems.Johns Manville.Mule-Hide Products Co., Inc.Versico Incorporated.2. Thickness: 60 mils, nominal.3. Exposed Face Color: White, or grey where specified.
  - d. GAF Materials Corporation.
  - e. GenFlex Roofing Systems.
  - f. Johns Manville.
  - g. Mule-Hide Products Co., Inc.
  - h. Versico Incorporated.
3. Thickness: 60 mils, nominal.
4. Exposed Face Color: White, or grey where specified.

## **2.02 AUXILIARY MEMBRANE ROOFING MATERIALS**

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
- B. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- C. Sheet Flashing: Manufacturer's standard unreinforced thermoplastic polyolefin sheet flashing, 55 mils thick, minimum, of same color as sheet membrane.
- D. Bonding Adhesive: Manufacturer's standard, water based.
- E. Slip Sheet: Manufacturer's standard, of thickness required for application.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

## **2.03 ROOF INSULATION**

- A. General: Cut and repair preformed roof insulation boards manufactured or approved by TPO membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for

application.

- B. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes required for sloping to drain for proper drainage.

#### **2.04 INSULATION ACCESSORIES**

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Full-Spread Applied Insulation Adhesive: Insulation manufacturers recommended spray-applied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

### **PART 3 - EXECUTION**

#### **3.01 PRE-INSTALLATION ROOFING CONFERENCE**

- A. Conduct conference at Project site.
- B. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
- C. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
- D. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- E. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
- F. Review structural loading limitations of roof deck during and after roofing.
- G. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
- H. Review governing regulations and requirements for insurance and certificates if applicable.
- I. Review temporary protection requirements for roofing system during and after installation.
- J. Review roof observation and repair procedures after roofing installation.

### **3.02 EXAMINATION**

- A. Examine substrates, areas, and conditions, with installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
  - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.03 PREPARATION**

- A. Clean substrate of substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### **3.04 SUBSTRATE BOARD**

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
- B. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

### **3.05 INSULATION INSTALLATION**

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to required slopes.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Fasten cover boards according to requirements in FM Approvals "RoofNav" for specified Windstorm Resistance Classification.
- G. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- H. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
- I. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- J. Mechanically Fastened and Adhered Insulation: Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  - 1. Fasten first layer of insulation according to requirements in FM Approvals "RoofNav" for specified Windstorm Resistance Classification.
  - 2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
  - 3. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
  - 4. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- K. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.

### **3.06 ADHERED MEMBRANE ROOFING INSTALLATION**

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate and method required by manufacturer.

- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
- H. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
- I. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
- J. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- K. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

### **3.07 FLASHING INSTALLATION**

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and method required by manufacturer.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### **3.08 FIELD QUALITY CONTROL**

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- B. The Contractor shall water test all roof overlay areas in the presence of the City's Inspector.
- C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.



### **3.09 PROTECTING AND CLEANING**

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Final Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

### **3.10**

- A. Special Manufacturer's Warranty: Manufacturer's standard or customized form, without monetary limitation ("No Dollar Limit" (NDL) warranty), in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
  - 1. 1. Special warranty includes membrane roofing, flashings, roof insulation, fasteners, cover boards, substrate board, roofing accessories, and other components of membrane roofing system.
  - 2. Warranty Period: Date shall be 15 years from date of Final Completion.
- B. Special Project Warranty: Submit roofing installer's warranty, signed by installer, covering the work of this Section, including all components of membrane roofing system such as membrane roofing, flashing, roof insulation, fasteners, cover boards, substrate boards, air barriers, roof pavers, and walkway products, for the following warranty period:
  - 1. Provide a 5-year workmanship warranty.

**END OF SECTION**

## **SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, and exterior penetrations.
- B. Sealants for joints within sheet metal fabrications.
- C. Sheet membrane flashing underlayment.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- C. Section 06 10 00 - Rough Carpentry: Field fabricated roof curbs.
- D. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.
- E. Section 07 51 00 Built-Up Bituminous Roofing: Repair and flashing associated with work of this contract.
- F. Section 08 45 13: Structured Polycarbonate Panel Assemblies

#### **1.03 REFERENCE STANDARDS**

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- F. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.
  3. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

### **PART 2 PRODUCTS**

#### **2.01 SHEET MATERIALS**

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) thick base metal.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
- C. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) thick; plain finish shop pre-coated with modified silicone coating.

1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
  2. Color: As selected by Architect from manufacturer's standard colors.
- D. Review assembly components to which flashing is applied and propose flashing materials compatible and appropriate with the materials that they are in contact with.

## **2.02 FLASHING UNDERLAYMENT**

- A. Sheet Membrane Underlayment at Flashings: Self-adhered, cold-applied composite rubberized asphalt sheet membrane consisting of rubberized asphalt bonded to a cross-laminated high-density polyethylene film with primers and seam sealers as required for a complete watertight installation; provide materials compliant with applicable regulations limiting VOCs.
1. Under Sheet Metal and Flashing: Minimum 40-mil thick, high temperature self-adhering, polymer-modified, bituminous sheet membrane, complying with ASTM D1970, manufacturers and types as follows:
  2. Basis-of-Design Product: The design for the system is based on the manufacturer identified below. Subject to compliance with requirements, provide the named product or a comparable product by the following:
  3. Basis-of-Design Product: GCP Applied Technologies; Grace Ice and Water Shield HT.
  4. Ensure named product is compatible with fluid-applied membrane air barrier material for a complete weathertight system.

## **2.03 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 4 inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

## **2.04 ACCESSORIES**

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
- B. Slip Sheet: Rosin sized building paper.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Zinc molybdate alkyd.
- E. Concealed Sealants: Non-curing butyl sealant.
- F. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- G. Plastic Cement: ASTM D4586/D4586M, Type I.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

### **3.02 PREPARATION**

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

### **3.03 UNDERLAYMENT**

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

### **3.04 INSTALLATION**

- A. Comply with drawing details.
- B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight.

**END OF SECTION**

## **SECTION 07 92 00 - JOINT SEALANTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.
- D. Field quality control

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. A. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- C. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2022.
- B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- C. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
- D. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).

#### **1.04 ACTION SUBMITTALS**

- A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.

4. Substrates the product should not be used on.
  5. Substrates for which use of primer is required.
  6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
  7. Sample product warranty.
  8. Certification by manufacturer indicating that product complies with specification requirements.
- B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. CALGreen Submittals: Provide product data to demonstrate that adhesives, sealants, and caulks used on the project meet the requirements of the following standards:
1. TABLE 5.504.4.1 - ADHESIVE VOC LIMIT; TABLE 5.504.4.2 - SEALANT VOC LIMIT as listed in Section 01 81 13 - Sustainable Design Requirements.
- B. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Submit manufacturer's letter of certification that products comply with specified requirements and are suitable for the uses intended.
- D. Product Test Reports:
1. Certified test results of elastomeric sealants showing compliance with specified requirements. Include results of aged performances including hardness, stain-resistance, adhesion and cohesion under cyclic movement, low temperature flexibility, modulus of elasticity at 100-percent strain, effects of heat and aging, and effects of accelerated weathering.
  2. Preconstruction field test results indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.
- E. Qualification Data: For Installer.



## **1.06 CLOSEOUT SUBMITTALS**

- A. Warranties: Executed special warranties specified in this Section.

## **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Installation Plan: Include schedule of sealed joints, including the following.
- E. Field Quality Control Plan:
1. Visual inspection of entire length of sealant joints.
  2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
- F. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
  2. Have a copy of the test method document available during tests.
  3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
  4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
- G. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
1. Record results on Field Quality Control Log.
  2. Repair failed portions of joints.
- H. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

## 1.08 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
- B. Exterior Sealants: Furnish a written warranty against leaks or other defects of materials and workmanship. Defects include but are not limited to changes in the structural, physical or chemical properties of the sealant materials that impair function or require abnormal maintenance, changes in surface finish, color or texture, failure in adhesion, weather resistance or durability, failure to prevent entry of water, or failure to comply with specified requirements.
1. This warranty shall not cover formation of cracks or defects in substrate materials adjacent to the seal, joint movement in excess of movement rating of sealant, or physical damage caused by others.
  2. Repair or replace defective materials and workmanship during warranty period without expense to Owner, including removal and replacement of other items as required.
  3. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.
  4. Warranty Period: Ten years from date of Substantial Completion.
- C. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
- D. Failure of the materials and workmanship include leakage, hardening, cracking, crumbling, melting, shrinkage or running of the sealant or caulking, or the staining of adjacent materials.
- E. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
  2. Disintegration of joint substrates from natural causes exceeding design specifications.
  3. Mechanical damage caused by individuals, tools, or other outside agents.

4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.
- F. Correct defective work within a five year period after Date of Substantial Completion.
- G. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

## **PART 2 PRODUCTS**

### **2.01 SUSTAINABLE MATERIAL REQUIREMENTS, GENERAL**

- A. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene, and trichloroethylene), except for aerosol products as specified in subsection 2, below.
- B. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.
- C. Refer to Section 01 81 13 - Sustainable Design Requirements for requirements for low-emitting materials.

### **2.02 JOINT SEALANT APPLICATIONS**

- A. Scope:
  1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between different exposed materials.
  2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.
    - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
    - c. Other joints indicated below.

3. Do not seal the following types of joints.
  - a. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
  - b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
  - c. Joints where installation of sealant is specified in another section.
  - d. Joints between suspended panel ceilings/grid and walls.

### **2.03 EXTERIOR JOINT SEALANTS**

- A. Exterior Silicone Weatherproofing and Control Joint Sealant: ASTM C920, also ASTM C1193 and tested under ASTM C719; Type S, Grade NS, Class 100/50, Use NT, M, G, A, and O; single component, low-modulus, non-sag sealant, use at exterior joints in vertical surfaces and non-traffic horizontal surfaces.
  1. Acceptable Sealants:
    - a. Dow Corning Corporation; Dow Corning 790.
    - b. Pecora Corporation; 890.
    - c. Tremco; Spectrem 1.
- B. Reglets and Flashings Polyurethane Sealant: ASTM C920, polyurethane-based sealant; Type S, Grade NS, Class 100/50, and Use T, NT, G, and M; single component elastomeric.
  1. Acceptable Sealants:
    - a. Sika Corporation, Inc.; SikaFlex-15LM.
    - b. Tremco, Inc.; Vulkem 921.

### **2.04 INTERIOR JOINT SEALANTS**

- A. Interior Weatherproofing and Control Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A, and O; single component, chemical curing, non-staining, non-bleeding, non-sagging type; color as selected; use in interior surfaces.
  1. Acceptable Sealants:
    - a. Pecora Corporation; Dynatrol I-XL.
    - b. Sika Corporation, Inc.; Sikaflex 1a.
    - c. BASF (Sonneborne); NP 1.

- d. Tremco; Dymonic FC.
- B. Wood Panel Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, O; single-component urethane, color to be selected.
1. Acceptable Sealants:
    - a. Sika Corporation, Inc.; Sikaflex 1a Construction Sealant.
    - b. BASF (Sonneborn); Sonolastic NP-1.
    - c. Tremco, Inc.; Vulkem 116.
- C. Interior Latex Joint Sealant: Provide product complying with ASTM C834, Type S, Use O, Grade NS; use at interior joints in vertical surfaces and non-traffic horizontal surfaces.
1. Acceptable Sealants:
    - a. Pecora Corporation; AC-20.
    - b. BASF (Sonneborn); Sonolac.
    - c. Tremco; Tremflex 834.
- D. Mildew Resistant Silicone Sealant: ASTM C920, Type S, Grade NS, Class 25; Use NT, G, A, and O; use on non-porous interior surfaces under high humidity and temperature extremes. For use in bathrooms, spas, and similar applications where joints need protection against fungi and bacteria.
1. Acceptable Sealants:
    - a. Dow Corning Corporation; Dow Corning 786.
    - b. Pecora, Inc. 898.
    - c. Tremco, Inc Tremsil 200.
- E. Acoustical Sealant for Exposed and Concealed Joints: Non-sag, paintable, nonstaining, latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90; use for drywall or plaster wall systems, bedding electrical boxes and other wall outlets.
1. Acceptable Sealants: One of the following or approved equal:
    - a. Pecora Corporation; AIS 919 Acoustical and Insulation Latex Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

- c. Tremco, Inc.; Tremflex 834 or Tremco Acoustical Sealant.

## 2.05 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
  - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
  - 2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
  - 3. Open Cell: 40 to 50 percent larger in diameter than joint width.
  - 4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Compressible Tape: 1/4-inch-thick, double-sided, closed-cell foam tape; use to seal interior partitions to window mullions.
  - 1. Norseal V988, 3M 4992, or equal
- E. Foam Sealing Tape:
  - 1. General: Open-cell, flexible, polyurethane foam impregnated with synthetic resin and developed to expand into openings and create seals which are airtight, thermally efficient, and vapor permeable.
  - 2. Applications: Door and window shim spaces at heads and jambs, and elsewhere as indicated.
  - 3. Basis-of-Design Product: Tremco Incorporated; ExoAir Trio.
  - 4. Tape Width: As required for intended applications.
- F. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- G. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

#### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

#### **3.03 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
  - 1. Width/depth ratio of 2:1.
  - 2. Neck dimension no greater than 1/3 of the joint width.
  - 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

- H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

#### **3.04 FIELD QUALITY CONTROL**

- A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

#### **3.05 CLEANING**

- A. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 74 19 Construction Waste Management and Disposal. Submit documentation for CALGreen compliance in accordance with Division 1 Sustainable Design Requirements.

#### **3.06 POST-OCCUPANCY**

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

**END OF SECTION**



## **SECTION 08 06 71 - DOOR HARDWARE SCHEDULE**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.02 SUMMARY**

- A. This Section references specification sections relating to commercial door hardware for the following:
  - 1. Swinging doors.
- B. Commercial door hardware includes, but is not necessarily limited to, the following:
  - 1. Mechanical door hardware.
- C. Related Sections:
  - 1. Division 08 Section "Door Hardware".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
  - 2. ICC/IBC - International Building Code.
  - 3. NFPA 70 - National Electrical Code.
  - 4. NFPA 80 - Fire Doors and Windows.
  - 5. NFPA 101 - Life Safety Code.
  - 6. NFPA 105 - Installation of Smoke Door Assemblies.
  - 7. State Building Codes, Local Amendments.
- E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

#### **1.03 SUBMITTALS**

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
  4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as

required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. .
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### **1.05 WARRANTY**

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

#### **1.06 MAINTENANCE SERVICE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

### **PART 1 PRODUCTS**

#### **2.01 SCHEDULED DOOR HARDWARE**

- A. Refer to "PART 3 – EXECUTION" for required specification sections.

### **PART 1 EXECUTION**

#### **3.01 DOOR HARDWARE SETS**

- A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
  2. The supplier is responsible for handing and sizing all products.
  3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.
1. Section 08 71 00 – Door Hardware.
- C. Manufacturer's Abbreviations:
1. GS - ASSA ABLOY Glass Solution
  2. MK - McKinney
  3. SA - SARGENT
  4. YA - Arrow, formerly known as Yale
  5. RO - Rockwood
  6. NO - Norton
  7. PE - Pemko

D.

**Hardware Sets**

Set 1.0

Doors: 123A

2	Door Bottom Rail	DRS-10DF-B	314E	GS
2	Door Top Rail	DRS-4AC-T	314E	GS
1	Floating Header	HDF-1750x4000 HDFLPS06_FinSet1	314E	GS
2	Bottom Pivot	PV-FM-300END	US32D	GS
2	Rim Cylinder	as required	US10BE	
2	Locking Pull	LP3301DBU ADA LC	314E	RO
2	Strike	LPS12	314E	GS
2	Concealed Closer	OHC-609-105NHO		GS
2	Arm	OHC-609-ARM		GS
2	Mounting Clip	OHC-609-MC		GS

Set 2.0

Doors: 118A, 120A, 121A, 121B, 122A, 122B

			US10B	SA
1	Entry/Office Lock	11G05 OL	10B	
1	Cylinder	as required match existing system		
1	Balance of Hardware	Existing		

Set 3.0

Doors: 106A, 107A, 115A

3	HInge, Full Mortise	TA2714	US10B	
1	Privacy Lock w/ Occupancy Indicator	V21 8257 OL	US10B	
1	Cylinder	as rquired match existing system	10B	
1	Surface Closer	210 TPN	690	
1	Wall Stop	409	10BE	
1	Gasketing	S44D		

**END OF SECTION**

## **SECTION 08 14 16 - FLUSH WOOD DOORS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, acoustical, special function, and \_\_\_\_\_.
- B. Transom panels.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 018113: Requirements for certified wood and low-emitting materials.
- C. Section 08 11 13 - Hollow Metal Doors and Frames.
- D. Section 08 11 16 - Aluminum Doors and Frames: Interior aluminum frames for flush wood doors.
- E. Section 083400: Flush wood doors provided as part of special function sliding door assemblies.
- F. Section 08 71 00 - Door Hardware.
- G. Section 08 80 00 - Glazing.
- H. Section 09 21 16 - Gypsum Board Assemblies.
- I. Section 09 90 00 - Painting and Coating - LEED v4/Green Product Guide Spec: Field finishing of doors.

#### **1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).
- C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- E. ASTM E413 - Classification for Rating Sound Insulation; 2022.

- F. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.
- G. AWI (QCP) - Quality Certification Program; Current Edition.
- H. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- I. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- K. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- L. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2022.
- M. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- N. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.
- O. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).
- P. WI (CCP) - Certified Compliance Program (CCP); Current Edition.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  - 2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical components.
  - 3. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.
  - 4. Refer to 018113: Requirements for certified wood and low-emitting materials.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
  2. Include certification program label.
- D. Samples: Submit two samples of door construction, 6 by 6 inches in size cut from top corner of door.
- E. Samples: Submit two samples of door veneer, 6 by 6 inches in size illustrating wood grain, stain color, and sheen.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Test Reports: Show compliance with specified requirements for the following:
1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- H. Manufacturer's Installation Instructions: Indicate special installation instructions.
- I. Manufacturer's qualification statement.
- J. Specimen warranty.
- K. Warranty, executed in Owner's name.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Forest Stewardship Council (FSC) Certified Products:
1. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
  2. Forest Certification: Provide components made with not less than 50 percent of wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- C. Woodwork Quality Assurance Program:
1. Comply with AWI (QCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section; [www.awiqcp.org/#sle](http://www.awiqcp.org/#sle).
    - a. This AWI (QCP) project is registered as project number \_\_\_\_\_.



2. Comply with WI (CCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section;  
[www.woodworkinstitute.com/#sle](http://www.woodworkinstitute.com/#sle).
3. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
4. Provide designated labels on shop drawings as required by quality assurance program.
5. Provide designated labels on installed products as required by quality assurance program.
6. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

#### **1.07 WARRANTY**

- A. See Section 017839 for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
  1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

### **PART 2 PRODUCTS**

#### **2.01 SUSTAINABLE DESIGN REQUIREMENTS**

- A. Refer to Section 018113: Requirements for requirements for low-emitting materials, Adhesives and Sealants.
- B. Refer to Section 018113: Requirements for requirements for low-emitting materials, Composite Wood Products.
- C. Certified Wood: Wood doors shall be certified as "FSC Pure" or "FSC Mixed Credit" according to FSC STD-01-00 and FSC STD-40-004.
- D. All wood doors shall be California Air Resources Board (CARB) 3120 Phase 2 Compliant with No Added Formaldehyde (NAF) label.

## 2.02 MANUFACTURERS

- A. Wood Veneer Faced Doors:
  - 1. Masonite Architectural; Aspiro Select Wood Veneer Doors:  
[www.architectural.masonite.com/#sle](http://www.architectural.masonite.com/#sle).
  - 2. Oregon Door: [www.oregondoor.com/#sle](http://www.oregondoor.com/#sle).
  - 3. VT Industries, Inc: [www.vtindustries.com/#sle](http://www.vtindustries.com/#sle).
- B. High Pressure Decorative Laminate (HPDL) Faced Doors:
  - 1. Oregon Door: [www.oregondoor.com/#sle](http://www.oregondoor.com/#sle).
  - 2. Masonite Architectural; Aspiro Choice Laminate Doors:  
[www.architectural.masonite.com/#sle](http://www.architectural.masonite.com/#sle).
  - 3. VT Industries, Inc: [www.vtindustries.com/#sle](http://www.vtindustries.com/#sle).
- C. Lead-Lined Wood Doors:
  - 1. Construction Specialties, Inc; Acrovyn Flush Doors, Lead Lined and 20 Minute Fire Rated: [www.c-sgroup.com/#sle](http://www.c-sgroup.com/#sle).
  - 2. \_\_\_\_\_.
- D. Sound-Rated Wood Doors:
  - 1. Masonite Architectural; Acoustically-Rated Door Solutions:  
[www.architectural.masonite.com/#sle](http://www.architectural.masonite.com/#sle).
  - 2. Overly Door Company: [www.overly.com/#sle](http://www.overly.com/#sle).

## 2.03 DOORS AND PANELS

- A. Doors: See drawings for locations and additional requirements.
  - 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
  - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
  - 3. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.
- B. Exterior Doors: Flush solid core construction and water repellent treated.
  - 1. Thickness: 1-3/4 inches, unless otherwise indicated.

2. Facing: Wood veneer for field transparent finish as indicated on drawings.
- C. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
1. Provide solid core doors at each location.
  2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
  3. Smoke and Draft Control Doors (Indicated as "S" on Drawings): In addition to required fire rating, provide door assemblies tested in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch wg pressure at both ambient and elevated temperatures for "S" label; if necessary, provide additional gasketing or edge sealing.
  4. Sound-Rated Doors: Minimum STC of \_\_\_\_\_, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
  5. High pressure decorative laminate (HPDL) finish as indicated on drawings.
  6. Hardboard facing with factory opaque finish as indicated on drawings.
- D. Transom Panels: Same construction and finish as door; same performance rating as door.

#### **2.04 DOOR AND PANEL CORES**

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking to provide adequate anchorage of hardware without through-bolting.
- C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction to achieve STC rating specified; plies and faces as indicated above.
- D. Lead Lined Doors: Equivalent to type, with bonded particleboard core (PC) with continuous lead sheet from edge to edge in center of core or between crossband and core; lead thickness; plies and faces as indicated above.

#### **2.05 DOOR FACINGS**

- A. Veneer Facing for Transparent Finish: (species), veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
  1. Vertical Edges: Any option allowed by quality standard for grade.

2. "Running Match" each pair of doors and doors in close proximity to each other.
  3. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.
  4. Transoms: Continuous match to doors.
- B. Veneer Facing for Opaque Finish: Medium density overlay (MDO), in compliance with indicated quality standard.
- C. Hardboard Facing for Opaque Finish: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides) hardboard, 1/8 inch thick.
- D. High Pressure Decorative Laminate (HPDL) Facing for Fire Doors: NEMA LD 3, SGF; color as selected; textured, low gloss finish.
- E. High Pressure Decorative Laminate (HPDL) Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; color as selected; textured, low gloss finish.
- F. Cross Banding Behind High Pressure Laminate Finish: 1 ply; of \_\_\_\_\_ material.
- G. Facing Adhesive: Type I - waterproof.

## **2.06 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
1. Provide solid blocks at lock edge for hardware reinforcement.
  2. Provide solid blocking for other throughbolted hardware.
- C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
- D. At exterior doors, provide aluminum flashing at the top and bottom rail and the sill of glazed openings for full thickness and width of door.
- E. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- F. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
1. Exception: Doors to be field finished.

- H. Cut and configure exterior door edge to receive recessed weatherstripping devices.
- I. Provide edge clearances in accordance with the quality standard specified.

## **2.07 FINISHES - WOOD VENEER DOORS**

- A. Refer to Section 018113: Requirements for requirements for low-emitting materials, Architectural Paints and Coatings including aerosol paint and coating systems.
- B. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
  - 1. Transparent:
    - a. System - TR-8, UV Cured Acrylated Polyester/Urethane.
    - b. Stain: As selected by Architect.
    - c. Sheen: Flat.
  - 2. Opaque:
    - a. System - OP-2, Catalyzed Lacquer.
    - b. Color: As selected by Architect.
    - c. Sheen: Satin.
- C. Factory finish doors in accordance with approved sample.
- D. Seal door top edge with transparent sealer to match door facing.

## **2.08 ACCESSORIES**

- A. Hollow Metal Door Frames: See Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Metal Louvers:
  - 1. Material and Finish: Roll formed steel; pre-painted finish to color as selected.
  - 2. Louver Blade: Inverted Y blade, sight proof, light proof.
  - 3. Louver Free Area: 50 percent.
  - 4. Frame: square profile style with tamper proof fasteners.
- C. Glazed Openings:
  - 1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.
  - 2. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.

3. Fire-Protection-Rated Glass: Safety Certification, 16 CFR 1201, Category II.
- D. Door Window Frames: Door window frames with glazing securely fastened within door opening.
1. Size: As indicated on drawings.
  2. Frame Material: 18 gauge, 0.0478 inch, galvanized steel.
  3. Metal Finish: (color) polyester powder coating.
- E. Glazing: See Section 08 80 00 - Glazing.
- F. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
- G. Astragals and Edges for Double Doors: Pairs of doors astragals, and door edge sealing and protection devices.
1. UL listed products in compliance with requirements of authorities having jurisdiction.
  2. Provide surface mounted astragal to cover or fill space for full door height between pair of doors or door and adjacent jamb.
  3. Astragal Type: \_\_\_\_\_, and with cutouts for other door hardware and sealing gasket.
  4. Edge Type: Beveled edge
  5. Material: Aluminum.
  6. Metal Finish: Beige powder coating.
- H. Astragals for Non-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge.
- I. Astragals for Fire-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.
- J. Door Hardware: See Section 08 71 00 - Door Hardware.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### **3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
  - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
  - 2. Install smoke and draft control doors in accordance with NFPA 105 requirements.
  - 3. Install exterior doors in accordance with ASTM E2112.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Field-Finished Doors: Trimming to fit is acceptable.
  - 1. Adjust width of non-rated doors by cutting equally on both jamb edges.
  - 2. Trim maximum of 3/4 inch off bottom edges.
  - 3. Trim fire-rated doors in strict compliance with fire rating limitations.
- D. Use machine tools to cut or drill for hardware.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Coordinate installation of glazing.
- G. Install door louvers plumb and level.

### **3.03 TOLERANCES**

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

### **3.04 ADJUSTING**

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

**END OF SECTION**

## **SECTION 08 33 26 - OVERHEAD COILING GRILLES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Overhead coiling metal grilles and operating hardware; electrically operated.
- B. Wiring from electric circuit disconnect to operator and to control station.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 06 10 00: Rough Carpentry.
- C. Section 05 11 00: Structural and Miscellaneous Steel
- D. Section 26 05 33 - Conduit Raceway and Boxes for Electrical Systems

#### **1.03 REFERENCE STANDARDS**

- A. ASTM B169/B169M - Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar; 2020.
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- F. NEMA MG 1 - Motors and Generators; 2021.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL (DIR) - Online Certifications Directory; Current Edition.
- I. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

#### **1.04 SUBMITTALS**

- A. Product Data: Provide, product data, general construction component connections and details, and electrical equipment.



- B. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- C. Manufacturer's Installation Instructions: Indicate installation sequences and procedures, adjustment and alignment procedures.
- D. Manufacturer's Qualification Statement.

### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience and approved by manufacturer.
- B. Provide certificate of compliance from authorities having jurisdiction indicating approval of grille and operating hardware assembly.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Overhead Coiling Grilles:
  - 1. Cornell Iron Works, Inc; Visionaire ESG12 Brick Pattern: [www.cornelliron.com/#sle](http://www.cornelliron.com/#sle).
  - 2. or equal.

### **2.02 GRILLES AND COMPONENTS**

- A. Grille: Aluminum; horizontal bar curtain, coiling on overhead counterbalanced shaft.
  - 1. Finish: medium bronze or dark bronze, final selection by Architect.
  - 2. Electric operation.
  - 3. Mounting: Within framed opening.
- B. Curtain: Round horizontal bars connected with vertical links.
  - 1. Horizontal bars: 5/16 inch diameter.
  - 2. Tube spacers: 1/2 inch diameter.
  - 3. Spacer spacing: 2" inch on center.
  - 4. Vertical links: 3/4" inch diameter.
  - 5. Link spacing: 9 inch on staggered center.

6. Bar Ends: Provide with nylon runners for quiet operation.
  7. Bottom Bar: 2 x 3-1/2 inch (50.8 x 88.9 mm) extruded aluminum tubular section reinforced with 3 x2 x 3/16 inch (76.2 x 50.8 x 4.76 mm) aluminum angle(s)..
- C. Guides: Extruded aluminum angles, of profile to retain grille in place with snap-on trim, mounting brackets of same metal. Heavy duty extruded aluminum sections with snap-on cover to conceal fasteners and polypropylene pile runners on both sides of curtain. Provide steel or aluminum tubes, floor saddles and hardware as recommended by manufacturer to support grille
1. Finish: same finish as grille
- D. Lock Hardware:
1. For motor operated units, additional lock or latching mechanisms are not required.
- E. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

## 2.03 MATERIALS

- A. Aluminum: ASTM B221 (ASTM B221M).

## 2.04 ELECTRIC OPERATION

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
1. Provide interlock switches on motor operated units.
- B. Electric Operators:
1. Mounting: Side mounted.
  2. Motor Enclosure:
  3. Motor Rating: 1/3 hp; MG operators, cycles less than 20 times a day.
  4. Motor Voltage: 120 volts, single phase, 60 Hz, or as recommended by manufacturer
  5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
  6. Controller Enclosure: NEMA 250 Type 1.
  7. Opening Speed: 6 to 9 inches per second.
  8. Brake: Adjustable friction clutch type, activated by motor controller.

9. Manual override in case of power failure.
  10. Refer to Section 26 27 26 Wiring Devices.
  11. Emergency Egress System: Provide wall mounted manual release system pull handle to disengage motor operator and automatically open grille for emergency egress without the use of electrical power. Release of pull handle will reset grille to normal motor operation.
- C. Control Station: Provide standard key-operated (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325. NEMA 1B
1. 24 volt circuit.
  2. Recessed, flush mounted, at adjacent wall location . Final location to be determined with Owner. Coordinate repair and replacement of wall finishes around location.
  3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
    - a. Primary Device: Provide electric sensing edge as required with momentary-contact control device.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

#### **3.02 INSTALLATION**

- A. Install grille unit assembly in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 26 05 83.
- F. Complete wiring from disconnect to unit components.

#### **3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

**3.04 ADJUSTING**

A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

**3.05 CLEANING**

A. Clean grille and components.

B. Remove labels and visible markings.

**END OF SECTION**

## **SECTION 08 41 26 - ALL-GLASS ENTRANCES AND STOREFRONTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Interior all-glass swing storefront with transoms and sidelites.
- B. Swinging doors.

#### **1.02 SUBMITTALS**

- A. Product Data: Manufacturer's descriptive literature for each component in all-glass entrance assembly. Details of construction relative to materials, dimensions of individual components, profiles, and finishes, including:
  - 1. Glass panels
  - 2. Rail and Patch fittings
  - 3. Closer and pivots
  - 4. Door hardware and accessories
- B. Shop Drawings: Drawings showing layout, dimensions, identification of components, and interface with adjacent construction.
  - 1. Include field measurements of openings.
  - 2. Include elevations showing:
    - a. Appearance of all-glass entrance layouts.
    - b. Locations and identification of manufacturer-supplied door hardware and fittings.
    - c. Locations, mounting heights and sizes of cut-outs and drilled holes for other door hardware
  - 3. Include details of:
    - a. Requirements for support and bracing at openings.
    - b. Installation details.
    - c. Appearance of manufacturer-supplied door hardware and fittings.
- C. Selection Samples: Two sets, representing manufacturer's full range of available metal materials and finishes.
  - 1. Metal Finishes: 6-inch (150 mm) long sections of rail fittings.

2. Glass: 12-inch (300 mm) square, showing exposed-edge finish and tint.
- D. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, **documenting compliance of exterior assemblies with wind pressure criteria.**
- E. Installer's Qualification Statement.
- F. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing, fabrication, and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, sidelites, transoms, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- G.
  1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Warranty information for each product.
- H. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible data, particularly where approval of the Door Hardware Schedule must precede fabrication of the other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work.

## **PART 2 PRODUCTS**

### **2.01 ALL-GLASS ENTRANCES AND STOREFRONTS ASSEMBLIES**

- A. Entrances and Storefronts: Factory fabricated assemblies consisting of frameless glass panels fastened with metal structural fittings in configuration indicated on drawings.
  - 1. Operational Loads: Designed to withstand door operation under normal traffic without damage, racking, sagging, or deflection.
  - 2. Prepared for all specified hardware whether specified in this section or not.
  - 3. Finished metal surfaces protected with strippable film.
  - 4. Factory assembled to greatest extent practicable; may be disassembled to accommodate shipping constraints.

### **2.02 ALL-GLASS ENTRANCES AND STOREFRONTS**

- A. Manufacturers (All Glass Doors): Subject to compliance with requirements, provide products by one of the following:
  - 1. Basis of Design: Rockwood (All Glass Door components) or approved equal

### **2.03 FITTINGS AND HARDWARE**

- A. General: Heavy-duty entrance door hardware units in sizes, quantities, and types recommended by manufacturer for all-glass entrance systems indicated. For exposed parts match metal and finish of patch fittings and rail fittings.
- B. Locking Pull System: Post-mount style door pulls with integrated deadbolt locking system in type and design as specified in the Hardware Sets. Pulls available in multiple head, floor, or combination locking and strike options, with outside keyed rim cylinder operation and inside turn piece activation. Customized sizing and configuration options.
  - 1. Manufacturers:
  - 2. Basis of Design: Rockwood (GS) - LP/DP Series or approved equal
- C. Overhead Concealed Closers (Medium Duty): Center hung, BHMA A156.4, Grade 1; units including arms, pivots, cover plates, mounting clips, and accessories required for complete installation. Provide separate closing and latching valves for closing speed, latch speed, backcheck, and optional hold open.
  - 1. Compact cast iron closers capable of being fully concealed in the frame head for center hung applications.
  - 2. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, interior or exterior application, and exposure to

weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ICC/ANSI A117.1.

3. Closer Accessories: Provide door closer accessories including custom spindles and templates as required for proper installation.
4. Double acting, non-handed with adjustable spring power size 1 through 3
5. Manufacturers:
  - a. Basis of Design: Rockwood (GS) - OHC 609 Series or approved equal

## 2.04 MATERIALS

### A. INTERIOR GLASS ENTRY DOORS

1. Clear Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated surfaces) Type I (transparent), Class 1 (clear) requirements. Provide products of thickness indicated that have been tested for surface and edge compression according to ASTM C 1048 and for impact strength according to CPSC 16 CFR, Part 1201 for Category II materials
  - a. Thickness: 1/2 inch
  - b. Exposed Edges: Flat polished
  - c. Butt Edges: Flat polished
  - d. Corner Edges: Mitered
2. Aluminum: Alloy and temper recommended by manufacturer for use and finish indicated, but not less than the strength and durability properties of ASTM B 221 (M) alloy 6063-T5.

## 2.05 ACCESSORIES

- A. Floating Transom Bar: Manufacturer's standard aluminum, floating transom bar clad in metal matching fittings in size recommended by manufacturer for application indicated.
  1. Support Fins: Tempered glass matching the transom glass
- B. Sidelite Channels: Provide manufacturer's standard head and sill channels for sidelite and transom-head support matching fitting-metal finish, unless otherwise indicated.
- C. Concealed Sidelite Channels: Provide manufacturer's standard recessed head and sill channels for concealed sidelite and transom-head support, unless otherwise indicated.
- D. Rails: Manufacturer's standard continuous horizontal fittings and as follows



1. Rail Locations: As follows:
    - a. Door tops and bottoms.
    - b. Transom tops. Provide with manufacturer's standard fixed-mounting system
    - c. Sidelite tops. Provide with manufacturer's standard fixed-mounting system
    - d. Sidelite bottoms. Provide with manufacturer's standard fixed-mounting system
  2. Top Rail Height: 4 inch tapered .
  3. Top Rail Profile: Tapered no less than 60 degrees from horizontal.
  4. Bottom Rail Height: 10 inch
  5. Bottom Rail Profile: Square.
  6. One piece dry glazed compression system that accommodates 3/8" to 9/16" or 5/8" to 13/16" thick glass.
  7. End Caps: One-piece aluminum, beveled.
  8. Material: Aluminum.
  9. Basis of Design: Rockwood #DRT/DRS x Height or approved equal
- E. Vertical Stiles: Manufacturer's standard continuous vertical fittings and as follows:
1. Stile Locations: As follows:
    - a. Door stiles on each side.
  2. Door Stile Dimension: 1 1/16" x 2" inch with cladding.
  3. Works in conjunction with door rails must have top and bottom rails (2 3/4" Square and Tapered, 4" Square and Tapered, 6" Square, 10" Square as shown
  4. Weather-stripping for rails.
  5. One piece dry glazed compression system that accommodates 1/2" to 9/16" thick glass.
  6. End Caps: One piece.
  7. Material: Aluminum base material with cladding
  8. Weather-stripping: 3/16", 3/8" black finish for vertical stile
  9. Glass Thickness: 1/2"

10. Basis of Design: Rockwood #DRVS or approved equal
- F. Accessory Fittings: Manufacturer's standard accessory fittings matching patch fitting or rail metal and finish for the following:
  1. Overhead doorstop.
  2. Center-housing lock.
  3. Glass-support fins.
- G. Anchors and Fastenings: Manufacturer's standard concealed anchors and fastenings
- H. Weather Stripping; Brush type; replaceable without removing all-glass entrance doors from pivots.

## **2.06 FABRICATION**

- A. General: Fabricate all-glass entrance components in sizes, profiles, and configurations indicated on Drawings.
- B. Provide holes and cutouts in glass to receive hardware, fittings, and accessory fittings before tempering glass. Do not cut, drill, or make other alterations to glass after tempering.
  1. Fully temper glass using horizontal (roller-hearth) process, and fabricate so that when glass is installed, roll-wave distortion is parallel with bottom edge of door or lite
- C. Factory assemble components and factory install hardware and fittings to greatest extent possible.

## **2.07 FINISHES**

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Color Anodic Finish: AA-M21C22A42/A44 (Mechanical Finish: smooth specular, buffed; Chemical Finish: etched, medium matte; Anodic Coating: Comply with AAMA 611
  1. Color: Dark bronze.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that openings are acceptable.
- B. Do not begin installation until substrates and openings have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- D. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Clean substrates thoroughly prior to installation.
- B. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's installation instructions and approved shop drawings.
- B. Install all-glass door assemblies after other finishing operations have been completed. Coordinate installation of recesses housings with installation of adjacent finishes.
- C. Set units level, plumb, and true to line, with uniform joints.
- D. Maintain uniform clearances between adjacent components.
- E. Set, seal, and grout floor closer cases as required to suit hardware and substrate indicated.
- F. Tolerances:
  - 1. Horizontal Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from level, non-cumulative.
  - 2. Vertical Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from plumb, non-cumulative.
  - 3. Variation from Plane or Indicated Location: Not more than 1/16 inch.

#### **3.04 ADJUSTING**

- A. Adjust doors to operate correctly, without binding to frame, sill, or adjacent doors.

- B. Adjust door hardware for smooth operation.
- C. Remove excess sealant and glazing compounds and dirt from surfaces.

**3.05 CLEANING**

- A. Clean installed work to like-new condition.

**3.06 PROTECTION**

- A. Protect installed products until Date of Substantial Completion.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure all-glass entrances are without damage or deterioration at the time of Substantial Completion

**3.07 DOOR HARDWARE SETS**

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
  - 1. Quantities listed are for each pair of doors, or for each single door
  - 2. The supplier is responsible for handing and sizing all products.
  - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
  - 5. Refer to Section 080671, Door Hardware Sets, for additional hardware sets.

Hardware Sets

Set 1.0

Doors 123A

2	Door Bottom Rail	DRS-10DF-B	314E	GS	084126
2	Door Top Rail	DRS-4AC-T	314E	GS	084126
1	Floating Header	HDF-1750x4000 HDFLPS06_FinSet1	314E	GS	084126
2	Bottom Pivot	PV-FM-300END	US32D	GS	084126
2	Rim Cylinder	as required	US10BE	GS	084126

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2	Locking Pull	LP3301DBU ADA LC	314E	RO	084126
2	Strike	LPS12	314E	GS	084126
2	Concealed Closer	OHC-609-105NHO		GS	084126
2	Arm	OHC-609-ARM		GS	084126
2	Mounting Clip	OHC-609-MC		GS	084126

**END OF SECTION**

## **SECTION 08 45 13 - STRUCTURED POLYCARBONATE PANEL ASSEMBLIES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Aluminum-framed assemblies glazed with translucent polycarbonate panels as roof and skylight assemblies.
- B. Design and engineering of structured polycarbonate panel assemblies.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 07 51 00 - Built-Up Bituminous Roofing: Repair of roof membrane.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim: Flashing for structured polycarbonate panel assemblies.
- D. Section 07 92 00 - Joint Sealants: Sealing joints between perimeter frame and adjacent construction.

#### **1.03 REFERENCE STANDARDS**

- A. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- B. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- C. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene 3 weeks before starting work of this section.

#### **1.05 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  - 2. Product Data for CALGreen 5.504.4.3 – Finish Material Pollutant Control; Architectural paints and coatings, including printed statement of VOC content and chemical

components.

3. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- B.
- C. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum components of panel assemblies..
- D. Shop Drawings:
1. Include plans, elevations, sections, details, and attachments to other work.
  2. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
  3. Submit engineering for skylight systems for deferred approval, including attachments to structure.
- E. Samples: In manufacturer's standard size.
1. For each type of structured-polycarbonate panel
  2. For each type of exposed finish for framing members.
- F. Structural Calculations: For panel assemblies indicated to comply with performance requirements and design criteria, including analysis data, signed and sealed by the qualified professional engineer responsible for their preparation
- G. Installation Data: Special installation requirements.
- H. Installer's Qualification Statement.
- I. Evaluation Reports: For translucent polycarbonate-panel assemblies from ICC-ES.
- J. Maintenance Data: For panel assemblies to included in maintenance manuals.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer

#### **1.07 WARRANTY**

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of panel assemblies that fail in materials or fabrication workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:

- a. Structural failures including, but not limited to, excessive deflection.
  - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - c. Water leakage.
2. Warranty Period: Five years from date of Substantial Completion.
- B. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace translucent polycarbonate panels that exhibit defects in materials or workmanship within specified warranty period.
1. Defects include, but are not limited to, the following:
    - a. Delamination.
    - b. Color changes exceeding requirements
    - c. Losses in light transmission beyond 6 percent from original when measured after 10 years according to ASTM D 1003.
  2. Warranty Period: 10 years from date of Substantial Completion.
- C. Special Aluminum-Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering
1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes
  2. Warranty Period: Five years from date of Substantial Completion
- D. Installer's Warranty: Installer agrees to repair or replace components of panel assemblies that fail in installation workmanship within specified warranty period
1. Failures include, but are not limited to, installation defects and water leakage.
  2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. A. Delegated Design: Engage a qualified structural engineer, licensed in the State of California, to design translucent polycarbonate-panel assemblies.
- B. Structural Loads: As indicated on Drawings and as specified.
- C. Deflection Limits:



1. Overhead Panel Assemblies: Limited to 1/60 of clear span for each assembly component of aluminum framing and panel joint according to the IBC, Table 1604.3, footnote h.
- D. Structural-Test Performance: Panel assemblies tested according to ASTM E 330, as follows:
1. When tested at positive and negative wind-load design pressures, assemblies do not show evidence of deflection exceeding specified deflection limits
  2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not show evidence of material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Durations: As required by design wind velocity, but not less than [10] seconds
- E. Windborne-Debris-Impact-Resistance Performance: Panel assemblies that pass missile-impact and cyclic-pressure tests when tested according to ASTM E 1886 and the testing information in ASTM E 1996 for Wind Zone 1.
1. Large-Missile Test: For glazed openings located within 30 feet (9.1 m) of grade.
  2. Small-Missile Test: For glazed openings located more than 30 feet (9.1 m) above grade
- F. Hail-Stone Impact Resistance: Panel assemblies that resist penetration by hail stone smaller than 1-3/16 inches (30 mm) in diameter, impacting panel surface at a final velocity up to 44 fps (13.4 m/s) per ASTM E 822
- G. Panel Clip Performance: Corrosion-resistant clips tested to meet a minimum 90-lb/sq. ft. (4.3-kPa) wind uplift when tested according to ASTM E 330.
- H. Panel End Seals: Continuous factory-applied, self-adhered micro-filter tape over open panel cells
- I. Panel Performance:
1. Smoke-Developed Index: 450 or less according to ASTM E 84, or 75 or less according to ASTM D 2843.
  2. Flame Spread: 25 or less when tested according to ASTM E 84.
  3. Combustibility Classification: Class CC1 based on testing according to ASTM D 635.
  4. Interior Finish Classification: Class A based on testing according to ASTM E 84.
  5. Visible Light Transmittance (VT) Loss: 6 percent maximum over 10 years, measured according to ASTM D 1003.

6. Thermal Aging: When exposed to 300 deg F (149 deg C) for 25 minutes, interior and exterior panels tested according to ASTM D 2244.
  - a. Color Retention: 0.75 (Hunter) units delta E maximum fade.
  - b. Color Darkening: 0.3 (Hunter) units delta L maximum.
  - c. Cracking or Cracking: None when exposed to 300 deg F (149 deg C) for 25 minutes.
  - d. Delamination: None when exposed to 300 deg F and 0 deg F (plus 149 and minus 17.8 deg C) for 25 minutes.
7. Impact Resistance: No failure at an impact of 500 lbf (677.9 Nm) when tested according to ASTM E 695.
8. Concentrated Loading: No damage while applying a load of 600 lbf (813.5 Nm) over 1 sq. ft. (0.093 sq. m.) when tested according to 29 CFR 1910.23(e)(8); and no damage while applying a load of 400 lbf (542.3 Nm) over 3 inches (152 mm) in diameter according to ASTM E 661.
- J. Water Penetration under Static Pressure: Provide panel assemblies that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- K. Thermal Movements: Allow for thermal movements from ambient- and surface-temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change (Range): [120 deg F (67 deg C), ambient; 180 deg F (100 deg C)] material surfaces.
- L. Energy Performance: Provide panel assemblies with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below and certified and labeled according to NFRC.
  1. Thermal Transmittance (U-Factor): Fixed panel and mill finish aluminum framing whole assemblies shall have U-factor of not more than [0.26 Btu/sq. ft. x h x deg F (1.76 W/sq. m x K) sloped application] as determined according to NFRC 100.
  2. Solar-Heat-Gain Coefficient (SHGC): Panel assembly shall have an SHGC of no greater than **0.33** as determined according to NFRC 200
  3. Visible Light Transmittance (VT): **0.23** or greater according to NFRC 202; or greater according to ASTM E 972, ASTM E 1084.
  4. Air Infiltration: Maximum air leakage through fixed glazing and skylight framing assemblies of [0.30 cfm/sq. ft. (1.50 L/s per sq. m)] of fixed wall area as determined

according to ASTM E 283 at a minimum static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

## 2.02 MANUFACTURER

- A. Translucent Polycarbonate-Panel Assemblies: Translucent assemblies that are supported by aluminum framing and glazed with translucent polycarbonate panels.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Kingspan Light + Air, LLC.; QuadSpan or approved equal.
- B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

## 2.03 COMPONENTS

- A. Translucent, Multiwall Cellular Polycarbonate Panel Thermally-Broken Assembly: Consisting of two independent, multiwall cellular cross-section, polycarbonate glazing panels, providing air-insulated spaces and coextruded UV protection, integrated into a panel assembly with concealed metal or polycarbonate connectors consisting of a one-piece "H" batten concept. Panelized assembly shall be incorporated into a complete aluminum framing system. Design panels for exterior panel replacement, independent of interior single panel and without exposing the interior, or compromising weather-tightness, or interfering with the normal working functions of the building
- B. Panel Thickness: Overall minimum 4 inches
- C. UV Resistance: Coextruded on weather-exposed surfaces during glazing panel manufacture
- D. Panel Assembly Color: Ice white matte over ice white matte.
- E. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
  - 1. Sound Transmission Class (STC): Paired-panel assemblies shall have a minimum overall acoustic value of STC:
    - a. Paired-Panel Assembly; 4 Inches Thick: STC 26
- F. Roof-Covering Classification: Class C according to ASTM E 108 or UL 790.
- G. Panel Performance:
  - 1. Color Retention: 3.0 (Hunter) units delta E, maximum fade as measured according to ASTM D 2244 when tested on minimum of two white color samples after panels have weathered outdoors in Arizona with panels exposed to a minimum 36.78 Langleys (1540 MJ/sq. m).

2. Haze Factor: Greater than 90 percent when tested according to ASTM D 1003.

#### **2.04 FABRICATION**

- A. Fabricate aluminum components that, when assembled, have the following characteristics:
  1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fitted joints with ends coped or mitered.
  3. Internal guttering systems or other means to drain water passing through joints and moisture migrating within assembly to exterior.
- B. Fabricate aluminum sill closures with weep holes and for installation as continuous component.
- C. Reinforce aluminum components as required to receive fastener threads

#### **2.05 ALUMINUM FRAMING SYSTEMS**

- A. Components: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
- B. Aluminum: Alloy and temper recommended in writing by manufacturer for type of use and finish indicated.
  1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
  2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
  3. Extruded Structural Pipe and Tubes: ASTM B 429 (/B 429M).
  4. Structural Profiles: ASTM B 308 (/B 308M).
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning skylight components
- D. Fasteners and Accessories: Manufacturer's standard, corrosion-resistant, nonstaining, and nonbleeding fasteners and accessories; compatible with adjacent materials.
  1. At closures, retaining caps, or battens, use ASTM A 193 (/A 193M), 300 series stainless-steel screws.
  2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
  3. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended in writing by manufacturer.
- E. Anchor Bolts: ASTM A 307, Grade A, galvanized steel

- F. Concealed Flashing: Corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Exposed Flashing and Closures: Aluminum sheet not less than 0.040-inch (1.02-mm) thick, factory finished to match framing.
- H. Framing Gaskets: Manufacturer's standard gasket system with low-friction surface treatment designed specifically for retaining translucent polycarbonate panels.
- I. Frame-System Sealants: As [recommended in writing by manufacturer]
  - 1. Sealant shall have a VOC content of 250 g/L or less.
  - 2. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- J. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities

## **2.06 ALUMINUM FINISHES**

- A. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.
  - 1. Color: Bronze anodized
- B. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker
- C. Color: Final selection by Architect

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected

### **3.02 INSTALLATION**

- A. General: Comply with manufacturer's written instructions.
  - 1. Do not install damaged components.
  - 2. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.

3. Rigidly secure nonmovement joints.
  4. Install anchors with separators and isolators to prevent metal corrosion, electrolytic deterioration, and immobilization of moving joints.
  5. Seal joints watertight unless otherwise indicated.
- B. Metal Protection: Where aluminum components will contact dissimilar materials, protect against galvanic action by painting contact surfaces with corrosion-resistant coating or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose
- C. Install components plumb and true in alignment with established lines and elevations
- D. Skylight Assemblies: Install continuous aluminum sill closures with weatherproof expansion joints and locked and sealed corners. Install components to drain water passing through joints and moisture migrating within assembly to exterior.
- E. Erection Tolerances: Install panel assemblies to comply with the following maximum tolerances:
1. Alignment: Limit offset from true alignment to 1/32 inch (0.8 mm) where surfaces abut in-line, edge-to-edge, at corners, or where a reveal or protruding element separates aligned surfaces by less than 3 inches (76 mm); otherwise, limit offset to 1/8 inch (3.2 mm).
  2. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3.2 mm in 3.7 m), but no greater than 1/2 inch (12 mm) over total length

### **3.03 FIELD QUALITY CONTROL**

- A. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements
- C. Prepare test and inspection reports

**END OF SECTION**

## **SECTION 08 71 00 - DOOR HARDWARE**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.02 SUMMARY**

- A. This Section includes commercial door hardware for the following:
  - 1. Swinging doors.
  - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
  - 1. Mechanical door hardware.
  - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
  - 1. Division 08 Section "Flush Wood Doors".
  - 2. Division 08 Section "All-Glass Entrances".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
  - 2. ICC/IBC - International Building Code.
  - 3. NFPA 70 - National Electrical Code.
  - 4. NFPA 80 - Fire Doors and Windows.
  - 5. NFPA 101 - Life Safety Code.
  - 6. NFPA 105 - Installation of Smoke Door Assemblies.
  - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
  - 1. ANSI/BHMA Certified Product Standards - A156 Series.

2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

### 1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Warranty information for each product.
  4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include



Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
  - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

#### **1.04 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
  - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

- F. California Building Code: Provide hardware that complies with CBC Section 11B.
1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
  2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
  3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
  4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
    - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
    - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
  5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.
    - a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
    - b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
    - c. The 5 pound (22.2 N) maximum force shall be validated for the size of the door used. The Building Materials Listing of the California State Fire Marshal shall indicate that the door hardware meets the 5 pound (22.2 N) force and shall also list the largest door that can be used.
  6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70

degrees to the closed position is 1.5 seconds minimum.

7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
  8. Thresholds shall comply with CBC Section 11B-404.2.5.
- G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
  2. Plans for existing and future key system expansion.
  3. Requirements for key control storage and software.
  4. Installation of permanent keys, cylinder cores and software.
  5. Address and requirements for delivery of keys.
- I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
  2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
  3. Review sequence of operation narratives for each unique access controlled opening.
  4. Review and finalize construction schedule and verify availability of materials.
  5. Review the required inspecting, testing, commissioning, and demonstration procedures
- J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

### **1.06 COORDINATION**

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

### **1.07 WARRANTY**

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 SCHEDULED DOOR HARDWARE**

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to Arrow. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded Arrow.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

### **2.02 BUTT HINGES**

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets
  - 1. Quantity: Provide the following hinge quantity:
    - a. Two Hinges: For doors with heights up to 60 inches.
    - b. Three Hinges: For doors with heights 61 to 90 inches.
    - c. Four Hinges: For doors with heights 91 to 120 inches.
    - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches
  - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
  - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
  - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight
4. Hinge Options: Comply with the following:
  - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
5. Manufacturers:
  - a. McKinney (MK) - TA/T4A Series, 5 knuckle

### **2.03 DOOR OPERATING TRIM**

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
  1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
  2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
  3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
  4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
  5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
  6. Manufacturers:
    - a. Rockwood (RO).
- B. Locking Pull System: Post-mount style door pulls with integrated deadbolt locking system in type and design as specified in the Hardware Sets. Pulls available in multiple head, floor, or combination locking options, with outside keyed rim cylinder operation and inside turn piece activation. Mounting applications for aluminum, glass, steel and wood doors, with customized sizing and configuration options. Locking pulls shall be provided with a 10"

clearance from the finished floor on the cylinder side to accommodate wheelchair accessibility.

1. Manufacturers:
  - a. Rockwood (RO) - LP Series.

#### **2.04 CYLINDERS AND KEYING**

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
  1. Manufacturers:
    - a. Match Existing, Field Verify.
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
  1. Threaded mortise cylinders with rings and cams to suit hardware application.
  2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
  4. Tubular deadlocks and other auxiliary locks.
  5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  6. Keyway: Match Facility Standard.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
  1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
  2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  3. Existing System: Field verify and key cylinders to match Owner's existing system.
- D. Key Quantity: Provide the following minimum number of keys:
  1. Change Keys per Cylinder: Two (2)
  2. Master Keys (per Master Key Level/Group): Five (5).
  3. Construction Keys (where required): Ten (10).

- E. Construction Keying: Provide construction master keyed cylinders.
- F. Key Registration List (Bitting List):
  - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
  - 2. Provide transcript list in writing or electronic file as directed by the Owner.

## **2.05 MORTISE LOCKS AND LATCHING DEVICES**

- A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all features and functionality as specified herein.
  - 1. Manufacturers:
    - a. Sargent Manufacturing (SA) - 8200 Series.

## **2.06 CYLINDRICAL LOCKS AND LATCHING DEVICES**

- A. Tubular Locksets, Grade 1 (Extra Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.
  - 1. Manufacturers:
    - a. Sargent Manufacturing (SA) - 11 Line.

## **2.07 LOCK AND LATCH STRIKES**

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
  - 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
  - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
  - 2. Strikes for Bored Locks and Latches: BHMA A156.2.



3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

## **2.08 DOOR CLOSERS**

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
  2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
  3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
  4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
  5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

## **2.09 DOOR STOPS AND HOLDERS**

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
1. Manufacturers:
    - a. Rockwood (RO).

## **2.10 ARCHITECTURAL SEALS**

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on

exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
- G. Pemko (PE).

## 2.11 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

## 2.12 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### **3.02 PREPARATION**

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

### **3.03 INSTALLATION**

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### **3.04 ADJUSTING**

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### **3.05 CLEANING AND PROTECTION**

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

### **3.06 DEMONSTRATION**

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

### **3.07 DOOR HARDWARE SETS**

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
  - 1. Quantities listed are for each pair of doors, or for each single door.
  - 2. The supplier is responsible for handing and sizing all products.
  - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as

required. Provide alternate solutions and proposals as needed.

B. Manufacturer's Abbreviations:

1. GS - ASSA ABLOY Glass Solution
2. MK - McKinney
3. SA - SARGENT
4. YA - Arrow, formerly known as Yale
5. RO - Rockwood
6. NO - Norton
7. PE - Pemko

**Hardware Sets**

**Set 1.0**

Doors 123A

2	Door Bottom Rail	DRS-10DF-B	314E	GS
2	Door Top Rail	DRS-4AC-T	314E	GS
1	Floating Header	HDF-1750x4000 HDF- LPS06_FinSet1	314E	GS
2	Bottom Pivot	PV-FM-300END	US32D	GS
2	Rim Cylinder	as required	US10BE	
2	Locking Pull	LP3301DBU ADA LC	314E	RO
2	Strike	LPS12	314E	GS
2	Concealed Closer	OHC-609-105NHO		GS
2	Arm	OHC-609-ARM		GS
2	Mounting Clip	OHC-609-MC		GS

**Set 2.0**

Doors: 118A, 120A, 121A, 121B, 122A,  
122B

1	Entry/Office Lock	11G05 OL	US10B	SA
1	Cylinder	as required match existing system	10B	
1	Balance of Hardware	Existing		

**Set 3.0**

Doors: 106A, 107A, 115A

3	Hinge, Full Mortise	TA2714	US10B	
1	Privacy Lock w/ Occupancy Indicator	V21 8257 OL	US10B	

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1	Cylinder	as required match existing system	10B
1	Surface Closer	210 TPN	690
1	Wall Stop	409	10BE
1	Gasketing	S44D	

**END OF SECTION**

## **SECTION 09 05 61 - COMMON WORK RESULTS FOR FLOORING PREPARATION**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
  - 1. Carpet tile.
  - 2. Thin-set ceramic tile.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
  - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- F. Patching compound.
- G. Remedial floor coatings.
- H. Remedial floor sheet membrane.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.
- C. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.
- D. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Limitations on curing requirements for new concrete floor slabs.
- E. Section 03 30 00 - Cast-in-Place Concrete: Floor topping.

### 1.03 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.
- C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

### 1.05 SUBMITTALS

- A. CALGreen Submittals:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content.
- B. Visual Observation Report: For existing floor coverings to be removed.
- C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
  - 1. Moisture and alkalinity (pH) limits and test methods.
  - 2. Manufacturer's required bond/compatibility test procedure.
- D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
  - 1. Manufacturer's qualification statement.
  - 2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
  - 3. Manufacturer's installation instructions.



4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- E. Testing Agency's Report:
1. Description of areas tested; include floor plans and photographs if helpful.
  2. Summary of conditions encountered.
  3. Moisture and alkalinity (pH) test reports.
  4. Copies of specified test methods.
  5. Recommendations for remediation of unsatisfactory surfaces.
  6. Product data for recommended remedial coating.
  7. Submit report to Architect.
  8. Submit report not more than two business days after conclusion of testing.
- F. Adhesive Bond and Compatibility Test Report.
- G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.
- H. Copy of RFCI (RWP).

#### **1.06 QUALITY ASSURANCE**

- A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
- C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- D. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
  2. Confirm date of start of testing at least 10 days prior to actual start.
  3. Allow at least 4 business days on site for testing agency activities.

4. Achieve and maintain specified ambient conditions.
  5. Notify Architect when specified ambient conditions have been achieved and when testing will start.
- E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.
- F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

### **1.08 FIELD CONDITIONS**

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Sustainable Material Requirements: Adhesives, sealants, and caulks used on the project shall conform to the VOC limits listed in Division 01 section "Sustainable Design Requirements".
- B. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
  1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
  2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.

3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
4. Products:
  - a. TEC, an H.B. Fuller Construction Products Brand; TEC Feather Edge Skim Coat: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
- C. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- D. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
  1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
  2. Products:
    - a. Allied Construction Technologies, Inc; AC Tech 2170: [www.actechperforms.com/#sle](http://www.actechperforms.com/#sle).
    - b. ARDEX Engineered Cements; ARDEX MC RAPID: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - c. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
    - d. Floor Seal Technology, Inc; MES 100 with Floor Seal FloorCem SLU: [www.floorseal.com/#sle](http://www.floorseal.com/#sle).
    - e. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
    - f. Maxxon Corporation; Aquafin SG2: [www.maxxon.com/#sle](http://www.maxxon.com/#sle).
    - g. Proflex Products, Inc; Moisture Barrier 25 with DPU - Deep Pour Underlayment: [www.proflex.us/#sle](http://www.proflex.us/#sle).
    - h. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: [www.sikafloorusa.com/#sle](http://www.sikafloorusa.com/#sle).
    - i. Stauf USA, LLC; ERP-270 Perma-Seal: [www.staufusa.com/#sle](http://www.staufusa.com/#sle).

- j. UZIN, a division of UFLOOR Systems Inc; UZIN PE 460 with UZIN PE 280 and UZIN NC 170 LevelStar: [www.ufloorsystems.com/#sle](http://www.ufloorsystems.com/#sle).
- E. Remedial Floor Sheet Membrane: Pre-formed multi-ply sheet membrane installed over concrete subfloor and intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
  - 1. Thickness: 28 mil (0.028 inch).
  - 2. Tape: Types recommended by underlayment manufacturer to install membrane and cover seams.
  - 3. Products:
    - a. GCP Applied Technologies; Kovara MBX: [www.gcpat.com/#sle](http://www.gcpat.com/#sle).

### **PART 3 EXECUTION**

#### **3.01 CONCRETE SLAB PREPARATION**

- A. Follow recommendations of testing agency.
- B. Perform following operations in the order indicated:
  - 1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
    - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
    - b. Removal of existing floor covering.
  - 2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
    - a. Do not attempt to remove coating or penetrating material.
    - b. Do not abrade surface.
  - 3. Preliminary cleaning.
  - 4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
  - 5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
  - 6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.

7. Specified remediation, if required.
8. Patching, smoothing, and leveling, as required.
9. Other preparation specified.
10. Adhesive bond and compatibility test.
11. Protection.

C. Remediations:

1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

### **3.02 REMOVAL OF EXISTING FLOOR COVERINGS**

- A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

### **3.03 PRELIMINARY CLEANING**

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

### **3.04 MOISTURE VAPOR EMISSION TESTING**

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

### **3.05 INTERNAL RELATIVE HUMIDITY TESTING**

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

### **3.06 ALKALINITY TESTING**

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

### **3.07 PREPARATION**

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with recommendations of testing agency.
- C. Comply with requirements and recommendations of floor covering manufacturer.
- D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

- E. Do not fill expansion joints, isolation joints, or other moving joints.

**3.08 ADHESIVE BOND AND COMPATIBILITY TESTING**

- A. Comply with requirements and recommendations of floor covering manufacturer.

**3.09 APPLICATION OF REMEDIAL FLOOR COATING**

- A. Comply with requirements and recommendations of coating manufacturer.

**3.10 INSTALLATION OF REMEDIAL FLOOR Sheet Membrane**

- A. Install in accordance with sheet membrane manufacturer's instructions.

**3.11 PROTECTION**

- A. Cover prepared floors with building paper or other durable covering.

**END OF SECTION**

## **SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal channel ceiling framing.
- C. Acoustic insulation.
- D. Exterior gypsum sheathing.
- E. Interior gypsum wallboard.
- F. Gypsum backing board for wet areas and restrooms.
- G. Joint treatment and surface coating.
- H. Textured finish system.
- I. Accessories.
- J. Acoustic (sound-dampening) wall and ceiling board.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 74 19 - Construction Waste Management and Disposal.
- C. Section 018113.
- D. Section 05 40 00 - Cold-Formed Metal Framing: Structural steel stud framing.
- E. Section 06 10 00 - Rough Carpentry: Building framing and structural sheathing, wood blocking.
- F. Division 07: Roof and parapet cover board provided as part of roofing assembly.
- G. Section 07 21 00 - Building Insulation.
- H. Section 07 27 00 - Air Barriers
- I. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire rated walls and through-penetration assemblies.
- J. Section 09 22 26.23 - Metal Suspension Systems : Suspended drywall grid



- K. Section 09 22 26.23 - Metal Suspension Systems : Metal transition moldings, shade pockets, fascias, and similar pre-finished extruded metal systems for suspended ceilings.

### 1.03 REFERENCE STANDARDS

- A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- C. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).
- D. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- I. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- J. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- K. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- L. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).
- M. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- N. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).
- O. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

- P. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- Q. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- R. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- S. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- T. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

#### **1.04 SUBMITTALS**

- A. Refer to Division 01 for submittal procedures.
- B. CALGreen Submittals: Provide product data for the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, include printed statement of VOC content.
- C. Product Data:
- D. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

#### **1.07 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 PRODUCTS**

### **2.01 MATERIAL REQUIREMENTS, GENERAL**

- A. Refer to Section 018113: Requirements for requirements for low-emitting materials, Adhesives and Sealants.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

### **2.02 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
  1. See PART 3 for finishing requirements.

### **2.03 CEILING FRAMING**

**NOTE: This article is for conventional "black-iron" system. Consider using 09 22 23 - Metal Suspension System. If used, delete this article.**

- A. General installation requirements: Conform to California Building Code Chapter 25.
- B. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Flat Hangers: Steel sheet, in size indicated on Drawings.
- E. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.
- F. Carrying Channels, typical at Gypsum Board Ceilings, unless otherwise indicated on Drawings: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges. 1 ½ in. deep and spaced at 48 in. on center, unless otherwise indicated on Drawings.
- G. Furring Members:

1. Hat-Shaped, Rigid Furring Channels: ASTM C645 , 7/8 inch deep. 25 gauge, fastened and perpendicular to carrying channels at 16 in. on center, typical, at gypsum board ceilings unless otherwise indicated on Drawings.

#### **2.04 BOARD MATERIALS - GENERAL**

A. Manufacturers - Gypsum-Based Board:

1. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
2. Georgia-Pacific Gypsum: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
3. National Gypsum Company: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
4. PABCO Gypsum: [www.pabco gypsum.com/#sle](http://www.pabco gypsum.com/#sle).
5. USG Corporation: [www.usg.com/#sle](http://www.usg.com/#sle).

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place. Long edges tapered, ends square cut.

1. Use Type X board, UL or WH listed.
2. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
3. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
5. Thickness:
  - a. Vertical Surfaces: 5/8 inch.
  - b. Ceilings: 5/8 inch.
6. Paper-Faced Products:
  - a. CertainTeed Corporation; Type X Drywall: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - b. Georgia-Pacific Gypsum; ToughRock Fireguard X: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  - c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond Fire-Shield Gypsum Board: [www.goldbondbuilding.com/#sle](http://www.goldbondbuilding.com/#sle).

- d. USG Corporation; Sheetrock Brand EcoSmart Panels Firecode X 5/8 in. (15.9 mm): [www.usg.com/#sle](http://www.usg.com/#sle).
  - e. USG Corporation; Sheetrock Brand Firecode X Panels 5/8 in. (15.9 mm): [www.usg.com/#sle](http://www.usg.com/#sle).
7. Glass Mat Faced Products:
- a. Georgia-Pacific Gypsum; DensArmor Plus Fireguard C Type X: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  - b. National Gypsum Company; Gold Bond eXP Fire-Shield X Interior Extreme Gypsum Panel: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
  - c. USG Corporation; USG Sheetrock Brand Glass-Mat Panels Mold Tough Firecode X.

## 2.05 BACKING BOARD FOR WET AREAS AND RESTROOMS

- A. Application: Surfaces behind tile in wet areas including restrooms and janitorial closets.
- B. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
- C. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
  - 1. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.
  - 2. Products:
    - a. CertainTeed Corporation; GlasRoc 5/8" Type X Tile Backer: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Georgia-Pacific Gypsum; DensShield Tile Backer: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
    - c. National Gypsum Company; Gold Bond eXP Tile Backer: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).

## 2.06 EXTERIOR GYPSUM SHEATHING

**NOTE: 1/2" board is commonly used. Determine if 5/8" is needed for fire resistance and coordinate with drawing notes, details. Potential cost savings to use 1/2" material. (Also applies to soffits)**

- A. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
- B. Application: Exterior sheathing, unless otherwise indicated.
- C. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

- D. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.
- E. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
- F. Core Type: Regular and Type X, as indicated.
- G. Type X Thickness: 5/8 inch.
- H. Regular Board Thickness: 1/2 inch.
- I. Edges: Square.
- J. Glass Mat Faced Products:
  - 1. CertainTeed Corporation; GlasRoc 1/2" Exterior Sheathing: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - 2. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - 3. Georgia-Pacific Gypsum; DensGlass Sheathing: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  - 4. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  - 5. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Fire-Shield Sheathing: [www.goldbondbuilding.com/#sle](http://www.goldbondbuilding.com/#sle).
  - 6. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing 1/2 in. (12.7 mm): [www.usg.com/#sle](http://www.usg.com/#sle).
  - 7. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode X 5/8 in. (15.9 mm): [www.usg.com/#sle](http://www.usg.com/#sle).
- K. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  - 1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
  - 2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
  - 3. Types: Regular and Type X, in locations indicated.
  - 4. Type X Thickness: 5/8 inch.
  - 5. Regular Type Thickness: 1/2 inch.
  - 6. Edges: Tapered.

7. Products:
  - a. CertainTeed Corporation; 5/8" Soffitboard Type C: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - b. CertainTeed Corporation; 5/8" Soffitboard Type X: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - c. Georgia-Pacific Gypsum; ToughRock Fireguard C Soffit Board:  
[www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).

## 2.07 ACOUSTIC INSULATION

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: Full depth of studs.
  1. Flame Spread Index: less than 25, when tested in accordance with ASTM E84.
  2. Smoke Developed Index: less than 50, when tested in accordance with ASTM E84.
  3. Green Guard Certified.
  4. Products:
    - a. Johns Manville; Sound SHIELD formaldehyde-free sound insulation:  
[www.jm.com/#sle](http://www.jm.com/#sle).
    - b. CertainTeed Corporation; CertaPro formaldehyde-free sound insulation:  
[www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - c. Owens Corning Corporation; PINK Next Gen formaldehyde-free sound insulation:  
[www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
- B. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
  1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
  2. Tape Thickness: 1/4 inch.
  3. Products:
    - a. Armacell LLC; ArmaComfort MTD: [www.armacell.us/#sle](http://www.armacell.us/#sle).
- C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
  1. Products:
    - a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: [www.titebond.com/#sle](http://www.titebond.com/#sle).

- b. Specified Technologies Inc; Smoke N Sound Acoustical Sealant:  
[www.stifirestop.com/#sle](http://www.stifirestop.com/#sle).

## 2.08 ACCESSORIES

- A. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
  - 1. Types: As detailed or required for finished appearance.
- B. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
  - 1. Corner Beads: Low profile, for 90 degree outside corners.
- C. Paper-Faced Beads, Joint Accessories, and Other Trim: ASTM C1047, unless noted otherwise.
  - 1. Material: Paper-Faced Metal Drywall Bead and Trim. Paper tape laminated to a sturdy, rust-resistant metal form, Coated paper tape flange intended for adhesion by means of joint compound. No nailing is required.
    - a. Manufacturer: USG Beadex® Brand Paper-Faced Metal Drywall Bead and Trim profiles.
    - b. Or equal.

## 2.09 JOINT AND SURFACE FINISHES

- A. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
  - 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
  - 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
  - 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
- B. Textured Finish Materials: Latex-based compound; plain.
  - 1. Products:
    - a. CertainTeed Corporation; Extreme Texture Coat/Acrylic Texture with M2Tech:  
[www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Sherwin-Williams; Tuff Surface Premium Texture Finish: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).



## 2.10 FASTENERS AND ADHESIVES

- A. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- B. Nails for Attachment to Wood Members: ASTM C514.
- C. Adhesive for Attachment to Wood, ASTM C557:
  - 1. Products:
    - a. Franklin International, Inc; Titebond PROvantage Professional Drywall Adhesive: [www.titebond.com/#sle](http://www.titebond.com/#sle).
    - b. Liquid Nails, a brand of PPG Architectural Coatings: [www.liquidnails.com/#sle](http://www.liquidnails.com/#sle).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

### 3.02 CEILING INSTALLATION

**NOTE: Delete/Deactivate this article if using drywall grid system specified in Section 09 22 26.23 - Metal Suspension System. RETAIN if using conventional "black iron" system.**

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
  - 1. Hangers: 48 inches o.c.
  - 2. Carrying Channels (Main Runners): 48 inches o.c.
  - 3. Furring Channels (Furring Members): 16 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
  - 2. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
- D. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension

system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

1. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
- E. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- F. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
- G. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- H. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- I. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

### **3.03 ACOUSTIC ASSEMBLIES**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1. Place two beads continuously on substrate before installation of perimeter framing members.
  2. Place continuous bead at perimeter of each layer of gypsum board.
  3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

### **3.04 BOARD INSTALLATION**

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.

- C. Double-Layer, Nonrated: Construct assemblies using product types specified for applications indicated on the drawings. Place first layer parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
  - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
  - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- G. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:
  - 1. Single-Layer Applications: Adhesive application.
  - 2. Double-Layer Application: Install base layer using screws or nails. Install face layer using adhesive.

### **3.05 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
  - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
  - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

### **3.06 JOINT TREATMENT**

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
  - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 3. Level 3: Walls to receive textured wall finish.
  - 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
  - 5. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
  - 6. Level 0: Temporary partitions.
- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
  - 2. Taping, filling, and sanding is not required at surfaces behind fixed cabinetry.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

### **3.07 TEXTURE FINISH**

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
- B. Texture Required: match existing.

### **3.08 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

## **SECTION 09 22 26.23 - METAL SUSPENSION SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Suspension System Framing and Furring for flat or curved Plaster and Gypsum Board Assemblies
  - 2. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

#### **1.02 RELATED SECTIONS**

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.
- B. Section 09 21 16 - Gypsum Board Assemblies - Gypsum Board
- C. Division 21 Sections - Fire Suppression systems.
- D. Division 23 Sections - Mechanical Work
- E. Division 26 Sections - Electrical Work

#### **1.03 REFERENCES**

- A. ASTM A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- B. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability".
- D. ASTM D610 Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
- E. ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus.
- F. ASTM C635/C635M Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- G. ASTM C636/C636M Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

- H. ASTM C 1858 Standard Practice for Design, Construction, and Material Requirements for Direct Hung Suspended T-bar Type Ceiling Systems Intended to Receive Gypsum Panel Products in Areas Subject to Earthquake Ground Motions.
- I. ASTM C645 Standard Specification for Nonstructural Steel Framing Members.
- J. ASTM C754 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- K. ASTM C840 Specification for Application & Finishing of Gypsum Board.
- L. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- M. ASTM E 119 Standard Test Method for Fire Tests of Building Construction and Material (if applicable).
- N. CISCA (Ceilings & Interior Systems Construction Association) - Ceilings Systems Handbook.
- O. ESR-1289 ICC-ES Evaluation Report.
- P. Underwriters Laboratories Inc. (UL) Fire Resistance Directory

#### **1.04 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical literature, specifications and installation instructions with Project conditions and materials clearly identified or detailed for each required system.
- B. Shop Drawings: Submit reflected ceiling plans drawn to scale. Include coordinated penetrations and ceiling-mounted items. Include any necessary details or drawings from the manufacturer regarding recommended installation.
- C. Samples: 8 inch long samples of suspension system components indicated in specifications and drawings, including main runner, cross tees and angle molding.
- D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

#### **1.05 QUALITY ASSURANCE**

- A. Single-Source Responsibility: To ensure proper interface, all drywall framing components shall be produced or supplied by a single manufacturer.
- B. All accessory components from other manufacturers shall conform to ASTM standards.

- C. Installer Qualifications: Must be experienced in the installation of systems similar to those specified herein.
- D. Fire Resistance Ratings: As indicated by reference to design designations in UL Fire Resistance Directory, for types of assemblies in which drywall ceilings function as a fire protective membrane and tested per ASTM E 119. Installation in accordance with the UL Design being referenced.

#### **1.06 COORDINATION**

- A. Coordinate drywall furring work with installers of related work including, but not limited to acoustical ceilings, building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
- B. All work above the ceiling line should be completed prior to installing the drywall sheet goods. There should be no materials resting against or wrapped around the suspension system, hanger wires or ties.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to project site in original, unopened packages fully identified with name, brand, type and grade.
- B. Promptly inspect delivered materials, file freight claims for damage during shipment and order replacement materials as require.
- C. Store in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes. Protect materials from soiling, rusting and damage.

#### **1.08 WARRANTY**

- A. Suspensions System: Submit a written limited warranty executed by the manufacturer, agreeing to repair or replace grid components that are supplied with a hot-dipped galvanized coating or aluminum base material. Failures include, but are not limited to: The occurrence of 50% red rust as defined by ASTM D610 test procedures as a result of defects in materials or factory workmanship.
- B. Warranty Period: Grid: Ten years from date of installation.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

#### **1.09 EXTRA MATERIALS**

- A. Provide extra materials in the manufacturer's unopened packaging, with the manufacturer's label intact: Suspension System Components - minimum 5% of each type installed.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Suspension Systems: Armstrong World Industries, Inc., United States Gypsum Company (USG), CertainTeed Ceilings, or equal

### **2.02 SUSPENSION SYSTEMS**

- A. Physical Characteristics
  - 1. Commercial quality, cold-rolled steel (minimum 0.0179 inch prior to protective coating, ASTM C645), hot-dipped galvanized finish (per ASTM A653/A653M).
  - 2. Knurled face.
  - 3. Heavy-duty materials for maximum rigidity and screw grip.
  - 4. 0.020" metal thickness.
  - 5. Cross-tees feature staked -on tabs to facilitate tightness, ease of installation.
  - 6. G40 hot-dipped galvanization, minimum, G90 at extreme of exterior environments.
- B. Components, sizes, gages, shapes and accessories as indicated in the drawings or as recommended to provide a complete system:
  - 1. Main runners.
  - 2. Primary cross tees.
  - 3. Clips and accessories.
  - 4. Linear light trim kits
  - 5. Support Hangars
  - 6. Screws for wallboard application shall be bugle head screws in accordance with thickness of material used.
  - 7. Metal Trim or Plastic Members (by others):
    - a. Corner bead: Minimum #26 gauge, zinc alloy or plastic square edge type with expanded flanges.
    - b. Casing bead: Minimum #24 gauge, zinc alloy or plastic square edge type with expanded flanges.
    - c. Control Joints: Minimum #26 gauge, roll-formed zinc alloy, extruded aluminum or plastic with expanded flanges.



### **2.03 STRUCTURAL CLASSIFICATION**

- A. Main Beam shall be heavy duty per ASTM C 635.
- B. Classification can require wires to be closer together for additional loading when used to support double layer gypsum, verticals, slopes, domes, half barrels, circles, soffits, canopies, and step conditions which call for loading or unusual designs and shapes in drywall construction. Using cross tees in the construction of circles, barrels, etc. is common in order to hold the radius.
- C. Deflection of fastening suspension system supporting light fixtures, ceiling grilles, access doors, verticals and horizontal loads shall have a maximum deflection of 1/360 of the span.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION - GENERAL**

- A. Install suspension system and panels in accordance with the manufacturer's instructions, in compliance with ASTM installation standard, and with applicable codes.
- B. The system can be installed in interior or exterior applications.
- C. To secure to metal clips, concrete inserts, steel bar joist or steel deck, use power actuated fastener, or insert. Coordinate hanger wire layout with layout of ceiling mounted equipment.
- D. Install hanger wire as indicated on drawing. Provide additional wires at light fixtures, grilles, and access doors where necessary. A pigtail knot shall be used with three tight wraps at top and bottom fastening locations.
- E. Control Joints: Roll formed zinc alloy, aluminum, or plastic for expansion and contraction as shown on drawings.
- F. Expansion Joints: Roll formed zinc alloy, aluminum, or plastic for expansion and contraction as shown on drawings.
- G. Main beams shall be suspended from the overhead construction with hanger wire, spaced along the length of the main beams as indicated on the drawings..
- H. Install cross tees at on center spacing as specified by the drywall manufacturer. Typical drywall cross tee spacing:
  - 1. 16 inches on center with 5/8 or 1/2 inch gypsum board
  - 2. 24 inches on center with 5/8 inch gypsum board
- I. Other items such as wood, sheet metal, or plastic panels should be screwed to comply with deflection limit equivalent to that of the ceiling installation.

- J. Use channel molding or angle molding to interface with Drywall Grid System to provide perimeter attachment or to obtain drop soffits, verticals, slopes, etc.
- K. To suspend a second ceiling beneath a new or existing drywall ceiling, without breaching the integrity of the upper ceiling, use appropriate clip. To form a transition from a drywall ceiling to an acoustical ceiling, use appropriate transition clip spaced as required for expected loads.
- L. For light fixtures use secondary framing cross tees to frame opening.

### **3.02 INSTALLATION - INTERIOR APPLICATIONS**

- A. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.
- B. Additional bracing as indicated on drawings.

**END OF SECTION**

## **SECTION 09 29 00 - GYPSUM BOARD**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Interior Gypsum Board:
  - 2. Tile backing panels for wall tile.
  - 3. Metal trim accessories, auxiliary materials, joint treatment, corner guards and skim-coating.
- B. Related Requirements:
  - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
  - 2. Section 01 74 19 – Construction Waste Management and Disposal .
  - 3.
  - 4. Section 06 10 00 "Rough Carpentry" for wood framing that supports gypsum board panels.
  - 5. Section 07 21 00 "Building Insulation" for insulation installed in gypsum board assemblies.
  - 6. Section 07 92 00 "Joint Sealants" for acoustical sealants installed in gypsum board assemblies.
  - 7. Section 09 90 00 "Painting" for primers and topcoats applied to gypsum board surfaces.

#### **1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. CALGreen Submittals:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
- C. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

### **1.04 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 - PRODUCTS**

### **2.01 GYPSUM BOARD, GENERAL**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### **2.02 INTERIOR GYPSUM BOARD**

- A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Georgia-Pacific Building Products.
  - 2. National Gypsum Company.
  - 3. PABCO Gypsum.
  - 4. Temple-Inland Building Products by Georgia-Pacific.

5. United States Gypsum Company.
  6. Equal.
- C. Gypsum WallBoard:
1. Core: 5/8 inch or as required to flush with adjacent finishes.
  2. Long Edges: Tapered.

### **2.03 TILE BACKING PANELS FOR WALL TILE**

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. CertainTeed Corporation; "GlasRoc Tile Backer."
    - b. Georgia-Pacific Building Products; "DensShield Tile Backer."
    - c. Temple-Inland Building Products by Georgia-Pacific; "GreenGlass Tile Backer"
    - d. Equal.
  2. Core: 5/8 inch.
  3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

### **2.04 METAL TRIM ACCESSORIES**

- A. Typical Interior Trim: ASTM C 1047.
1. Material: Screw-attached, galvanized or aluminum-coated steel sheet. No paper-faced trim products are acceptable.
  2. Shapes:
    - a. Cornerbead.
    - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - c. Expansion joint for 1/2" gap
    - d. Square-Edge Cornerbead: With notched or flexible flanges.

### **2.05 JOINT TREATMENT MATERIALS**

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:

1. Interior Gypsum Board: Paper.
  2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
  3. Fill Coat: For second coat, use setting-type, sandable topping compound.
  4. Finish Coat: For third coat, use drying-type, all-purpose compound.
  5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
- D. Joint Compound for Tile Backing Panels:
1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

## **2.06 AUXILIARY MATERIALS**

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
1. Adhesives shall have a VOC content of 50 g/L or less.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- D. Insulation: As specified in Section 07 21 00 "Building Insulation."
- E. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 APPLYING AND FINISHING PANELS, GENERAL**

- A. Comply with ASTM C 840
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except long edges at right angles to framing and in applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### **3.03 APPLYING INTERIOR GYPSUM BOARD**

- A. Install interior gypsum board in the following locations:
  - 1. Paper faced gypsum panels: Throughout, unless otherwise indicated.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
3. Fastening Methods: Apply gypsum panels to supports with steel drill screws. Do not penetrate board face with screw heads.

**3.04 APPLYING TILE BACKING PANELS**

- A. Glass-Mat, Water-Resistant Tile Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile, and non-wet locations as indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

**3.05 INSTALLING TRIM ACCESSORIES**

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions. No "mudded-in" trim accessories are acceptable.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Typical Interior Trim: Install in the following locations:
  1. Cornerbead: Use at outside corners unless otherwise indicated.
  2. LC-Bead: Use at exposed panel edges.

**3.06 FINISHING GYPSUM BOARD**

- A. A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.



- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 0: In areas of temporary construction.
  - 2. Fire Tape Only: Ceiling plenum areas, concealed areas, and where indicated.
  - 3. Level 2: Panels that are substrate for tile.
  - 4. Level 3: Panels that are substrate for wood wall panels and fabric-wrapped wall panels.
  - 5. Level 4: At panel surfaces in "back-of-house" areas not visible to the public, including staff areas, mechanical spaces, storage rooms, and similar spaces, but excluding panel surfaces that are scheduled to receive paints with semi-gloss or gloss sheen.
    - a. Primer and its application to surfaces are specified in other Division 09 Sections.
  - 6. Level 5: At panel surfaces that will be exposed to view unless otherwise indicated; at panel surfaces that are scheduled to receive paints with semi-gloss or gloss sheen; and where otherwise indicated on Drawings.
    - a. Primer and its application to surfaces are specified in other Division 09 Sections.
- E. Tile Backing Panels: Finish according to manufacturer's written instructions.
  - 1. 1. Where exposed, finish according to manufacturer's written instructions for use as exposed board.

### **3.07 PROTECTION**

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION 09 29 00**

## **SECTION 09 30 00 - TILING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Ceramic accessories.
- D. Ceramic trim.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- C. Section 09 29 00 - Gypsum Board: Tile backer board.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- E. Section 22 30 00 - Plumbing Systems

#### **1.03 REFERENCE STANDARDS**

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.
- B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017 (Reaffirmed 2022).
- C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.
- D. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2021).
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2019.
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2021.

- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 1999 (Reaffirmed 2019).
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2019).
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2019).
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).
- K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).
- L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).
- M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
- N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2019.
- O. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.
- P. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
- Q. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2014 (Reaffirmed 2019).
- R. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).
- S. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2019.
- T. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- U. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).

- V. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- W. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- X. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- Y. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

#### **1.05 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  - 2. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Setting and Grouting Systems: Indicate TCNA installation system for each type of tile and setting assembly.
- E. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Installer's Qualification Statement:
  - 1. Submit documentation of completion of apprenticeship and certification programs.
- H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Tile: 1 percent of each size, color, and surface finish combination.

#### **1.06 QUALITY ASSURANCE**

- A. Maintain one copy of ANSI A108/A118/A136 and TCNA (HB) on site.
- B. Installer Qualifications:
  1. Company specializing in performing tile installation, with minimum of five years of documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

#### **1.08 FIELD CONDITIONS**

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

### **PART 2 PRODUCTS**

#### **2.01 TILE**

- A. Manufacturers:
  1. Crossville: [www.crossville.com](http://www.crossville.com).
  2. Stone Source: [www.stonesource.com](http://www.stonesource.com)
  3. Daltile: [www.daltile.com](http://www.daltile.com)
  4. or equal.
- B. Glazed Wall Tile, Type WT-1: ANSI A137.1 standard grade.
  1. Moisture Absorption: <20.0% percent as tested in accordance with ASTM C373.
  2. Size: 3 by 6 inch, nominal.
  3. Color(s): Light Blue Glossy.
  4. Pattern: Stack bond.
  5. Trim: Schluter Systems as indicated in the drawings.
  6. Trim Units: Matching bullnose shapes in sizes coordinated with field tile.

7. Products:
    - a. Stone Source; Din: [www.stonesource.com/](http://www.stonesource.com/)
    - b. or equal.
  8. Location: Men and Women' Restroom; Gender Neutral Restrooms
- C. Ceramic Wall Panel, Type WT-2: ANSI 137.2.standards
1. Color(s): Verderame.
  2. Style: Ossido
  3. Size: 1m x 3m
  4. Thickness: 3mm
  5. Products:
    - a. Crossville; Ossido: [www.crossville.com](http://www.crossville.com)
    - b. or equal.
  6. Location: Foyer - drinking fountain alcove
- D. Porcelain Stone Floor Tile, Type FF-2: ANSI A137.1 standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
  2. Size: 12 in by 24 in inch, nominal.
  3. Thickness: 5/16 inch.
  4. Surface Finish: Matte.
  5. Color(s): Roam.
  6. Pattern: Running bond.
  7. Products:
    - a. Dal-Tile Corporation; Wanderwise: [www.daltile.com/#sle](http://www.daltile.com/#sle).
    - b. or equal.
  8. Location: Men and Women Restroom and Gender Neutral Restrooms

## 2.02 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching singletrim ceramic shapes in sizes coordinated with field tile.  
Where matching cove base not available, provide non-ceramic trim at base transition to floor
  - 1. Manufacturers: Same as for tile.
- B. Non-Ceramic Trim: Satin Nickel Anodized Aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
  - 1. Applications:
    - a. Thresholds at door openings.
    - b. Floor to wall joints.
  - 2. Manufacturers:
    - a. Schluter-Systems: [www.schluter.com/#sle](http://www.schluter.com/#sle).
    - b. or equal

## 2.03 SETTING MATERIALS

- A. Manufacturers:
  - 1. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  - 2. Custom Building Products: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
  - 3. LATICRETE International, Inc: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
  - 4. or equal.
- B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
  - 1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
  - 2. Products:
    - a. ARDEX Engineered Cements; ARDEX N 23 MICROTEC:  
[www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer:  
[www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
    - c. LATICRETE International, Inc[<>]: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).

d. or equal.

## 2.04 GROUTS

### A. Manufacturers:

1. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
2. Custom Building Products; \_\_\_\_\_: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
3. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout:  
[www.laticrete.com/#sle](http://www.laticrete.com/#sle).
4. or equal.

### B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.

1. Applications: Use this type of grout at walls and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As selected by Architect from manufacturer's full line.
4. Products:
  - a. ARDEX Engineered Cements; ARDEX FL: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  - b. Custom Building Products; Prism Color Consistent Grout:  
[www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
  - c. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout:  
[www.laticrete.com/#sle](http://www.laticrete.com/#sle).

### C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.

1. Applications: Where indicated at floors.
2. Color(s): As selected by Architect from manufacturer's full line.
3. Products:
  - a. ARDEX Engineered Cements; ARDEX WA: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  - b. Custom Building Products; CEG-IG 100% Solids Industrial Grade Epoxy Grout:  
[www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
  - c. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).



## 2.05 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
  2. Color(s): As selected by Architect from manufacturer's full line.
  3. Products:
    - a. ARDEX Engineered Cements; ARDEX SX: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. Custom Building Products; Commercial 100% Silicone Caulk: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
    - c. LATICRETE International, Inc; LATICRETE LATASIL: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
- B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.
  2. Color(s): As selected by Architect from manufacturer's full line.
  3. Products:
    - a. Merkrete, by Parex USA, Inc; Merkrete Grout Sealer: [www.merkrete.com/#sle](http://www.merkrete.com/#sle).

## 2.06 ACCESSORY MATERIALS

- A. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.
  2. Fluid or Trowel Applied Type:
    - a. Material: Synthetic rubber or Acrylic.
    - b. Thickness: 25 mils, minimum, dry film thickness.
    - c. Products:
      - 1) ARDEX Engineered Cements; ARDEX 8+9: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
      - 2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).

3) LATICRETE International, Inc; LATICRETE HYDRO BAN:  
[www.laticrete.com/#sle](http://www.laticrete.com/#sle).

- B. Backer Board: See Section 09 29 00 - Gypsum Board.
- C. Backer Board: Coated glass mat type complying with ASTM C1178/C1178Minorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
- D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- B. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- C. Verify that required floor-mounted utilities are in correct location.

#### **3.02 PREPARATION**

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with Section 09 29 00 - Gypsum Board.

#### **3.03 INSTALLATION - GENERAL**

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed or with metal trim as detailed.

- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

### **3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
  - 1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.
- B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

### **3.05 INSTALLATION - WALL TILE**

- A. Grout with standard grout as specified above. Sealed with grout sealer as recommended by grout manufacturer
- B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

### **3.06 CLEANING**

- A. Clean tile and grout surfaces.

### **3.07 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

## **SECTION 09 68 13 - TILE CARPETING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet and carpet tile

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 74 19 – Construction Waste Management and Disposal
- C. Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- D. Section 03 30 00 - Cast-in-Place Concrete for Interior Work: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
- E. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- F. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- E. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- F. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Current Edition.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:

1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  2. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for low-emitting materials.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit two, 4 inch long samples of edge strip.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- H. Installer's Qualification Statement.
- I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

#### **1.06 FIELD CONDITIONS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Tile Carpeting:
1. Interface, Inc; \_\_\_\_: [www.interface.com/#sle](http://www.interface.com/#sle).

2. Patcraft; [www.patcraft.com](http://www.patcraft.com). or equal

## 2.02 MATERIALS

- A. Tile carpeting to comply with CBC 11B-302.2 for attachment, firm cushion, pad, or backing, or n or no cushion or pad. Carpet tile shall have level loop, textured loop , level cut pile level cut/uncut pile texture. Pile height shall be 1/2" max height.
- B. Tile Carpeting, Type CPT1: Tufted Textured Loop, manufactured in one color dye lot.
  1. Product: Woven Gradience WG100 manufactured by Interface.
  2. Tile Size: 19.7 in by 19.7 in inch, nominal.
  3. Pile Height: 0.15 inch; Pile Thickness: 0.10 inch
  4. Color: Caribbean 108059.
  5. Pattern: Ashlar.
  6. VOC Content: Provide CRI (GLP) certified product; in lieu of labeling, independent test report showing compliance is acceptable.
  7. Fiber Content: Nylon.
  8. Gage: 1/12 inch.
  9. Stitches: 9.90 per inch.
  10. Tufted Yarn Weight: 26 oz/sq yd.
  11. Pile Density: 8,716 oz/cubic yd .
  12. Light Fastness: AATCC16-E.
  13. Primary Backing Material: GlasBac Tile.
- C. Tile Carpeting, Type CPT2: Multi-level Pattern Loop, manufactured in one color dye lot.
  1. Product: Textural Perception; Static Noise 10632 manufactured by Patcraft.
  2. Tile Size: 9 in by 36 in, nominal.
  3. Overall Thickness: 0.243 inch; Pile Thickness: 0.08 in
  4. Color: Juniper 00550.
  5. Pattern: Basketweave.
  6. VOC Content: Provide CRI (GLP) certified product; in lieu of labeling, independent test report showing compliance is acceptable.

7. Fiber Content: EcoSolution Q100 Nylon.
  8. Gage: 1/12 inch.
  9. Stitches: 10 per inch.
  10. Tufted Yarn Weight: 26 oz/sq yd.
  11. Pile Density: 7650 oz/cubic yd.
  12. Light Fastness: AATCC16-E.
  13. Primary Backing Material: Non-Woven Synthetic.
  14. Secondary Backing Material: EcoWorx Tile.
- D. Tile Carpeting, Type CPT3: Multi-Level Pattern Loop, manufactured in one color dye lot.
1. Product: On Neutral Ground 1; Running Stitch 10635 manufactured by Patcraft.
  2. Tile Size: 18"x36", nominal.
  3. Overall Thickness: 0.308 inch; Pile Thickness: 0.127 in
  4. Color: Sheer 00120.
  5. Pattern: Basketweave.
  6. VOC Content: Provide CRI (GLP) certified product; in lieu of labeling, independent test report showing compliance is acceptable.
  7. Fiber Content: Nylon.
  8. Gage: 1/10 inch.
  9. Stitches: 9 per inch.
  10. Tufted Yarn Weight 25 oz/sq yd.
  11. Pile Density: 7087 oz/cubic yd .
  12. Light Fastness: AATCC16-E.
  13. Primary Backing Material: Non-Woven Synthetic.
  14. Secondary Backing Material: EcoWorx Tile.

### **2.03 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

- B. Base: 3" high, cut to height, field verify condition type, wood, match existing siding finish, matching existing adjacent wood color.
- C. Edge Strips: Rubber, color as selected by Architect. Exposed edges of carpet shall be fastened to floor surfaces and have trim on entire length of exposed edge. Comply with CBC 11B-302.2 and 11B-303.
- D. Adhesives:
  - 1. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GLP) certified; in lieu of labeled product, independent test report showing compliance is acceptable.
- E. Carpet Tile Adhesive:
  - 1. Products:
    - a. XL Brands 2000 Plus adhesive
    - b. Recommended by carpet tile manufacturer.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
  - 1. Test in accordance with Section 09 05 61.
  - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
  - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- D. Verify that required floor-mounted utilities are in correct location.

#### **3.02 PREPARATION**

- A. Remove existing carpet tile.
- B. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.



### **3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Trim carpet tile neatly at walls and around interruptions.
- H. Complete installation of edge strips, concealing exposed edges.

### **3.04 CLEANING**

- A. Clean and vacuum carpet surfaces.

**END OF SECTION**

## **SECTION 09 84 30 - SOUND-ABSORBING WALL AND CEILING UNITS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Sound-absorbing wall panels.
- B. Mounting accessories.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

#### **1.04 SUBMITTALS**

- A. Product Data: Manufacturer's printed data sheets for products specified.
- B. Selection Samples: Manufacturer's samples of hardware and accessories involving color or finish selection.
- C. Shop Drawings: For unit assembly and installation
  - 1. Include plans, elevations, sections and mounting devices and details
  - 2. Include details at cutouts and penetrations for other work
  - 3. Include direction of panel
  - 4. Include details of panel head, base, joints and corners, including intersections.
- D. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company with not less than five years of experience in manufacturing acoustical products similar to those specified.
- B. Installers Qualifications: Acceptable to the manufacturer of the acoustical products being installed.

### **1.06 WARRANTY**

- A. Warranty Period: Limited three-year warranty covers defects in structural integrity of panels.

### **1.07 FIELD CONDITIONS**

- A. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication and indicate them on Shop Drawings
- B. Lighting: Do not install units until a permanent level of lighting is provided on surfaces to receive the units.
- C. Air Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- D. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for intended use.

### **1.08 DELIVERY, STORAGE AND HANDLING**

- A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
- B. Store units flat, in dry, well-ventilated space; do not stand on end.
- C. Protect edges from damage.

## **PART 2 PRODUCTS**

### **2.01 SOUND-ABSORBING WALL UNITS**

- A. Manufacturers:
  - 1. F-sorb;: [www.f-sorb.com](http://www.f-sorb.com)
- B. Sound Absorbing Units: Prefinished, factory assembled fabric-covered panels.
  - 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- C. Sound-Absorbing Units for Walls: [AP-1]
  - 1. Panel Core: Manufacturer's standard recycled polyester core.
  - 2. Panel Size: 48 in by 96 in at ceiling.. Refer to Wall elevation for sizes to cover walls. Sizes range from 48" to 96" length. Custom size as required based on wall elevation, divided equally per elevation.

3. Panel Thickness: 2 inches.
4. Corners: Square.
5. Color: Light Beige.
6. Mounting Method: Slide and engage "Z" clips into continuous wall track; min 20 gauge stain coat steel with wall clips mechanically mounted to back of panels.

## **2.02 FABRICATION**

- A. Standard Construction: Use manufacturer's standard construction unless otherwise indicated; with facing material applied to face, edges, and back border dimensionally stable core; and with rigid edges to reinforce perimeter against warpage and damage.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.
- C.

## **2.03 ACCESSORIES**

- A. Back-Mounting Accessories for wall panels: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
  1. Two-part Z-clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install acoustical units in locations as indicated, following manufacturer's installation instructions. Provide blocking as required and repair wall & ceiling finishes in kind.
- B. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- C. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
  1. Plumb and level.
  2. Flatness.

**3.03 CLEANING**

- A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

**3.04 PROTECTION**

- A. Provide protection of installed acoustical panels until Date of Substantial Completion.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

**END OF SECTION**

## **SECTION 09 90 00 - PAINTING**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

- A. This Section includes surface preparation and field painting and finishing of [new and existing] exposed exterior and interior items and surfaces.
- B. Painting of exposed exterior and interior fire sprinkler piping

#### **1.02 RELATED SECTIONS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections:
  - 1. Section 06 20 00 "Finish Carpentry," for shop finishing of interior woodwork.
  - 2. Section 07 92 00 "Sealants".
  - 3. Section 09 29 00 "Gypsum Board": Finish levels for gypsum board.

#### **1.03 SYSTEM DESCRIPTION**

- A. "Paint": As used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats (Refer to ASTM D16).
- B. Painting and coating products must comply with Green Seal standards in accordance with EPA Reference Test Method 24 and CFR Title 40, Part 60, Appendix A.
- C. Paint exposed surfaces whether or not colors are designated, 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. If color or finish is not designated, the Architect will select from standard colors or finishes available.
  - 1. Prepare, prime, and paint existing and new surface-mounted electrical raceway covers, including plastic and metal covers.
- D. Surfaces Not to be Painted:
  - 1. Exterior cast-in-place concrete and architectural concrete unless otherwise indicated.
  - 2. Stainless-steel fabrications.
  - 3. Factory-finished items specified in various Sections.

4. Prefinished wall, ceiling, and floor coverings.
5. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to, shop priming.
6. Code-Required Labels: Keep equipment identification and fire rating labels free of paint.
7. Surfaces concealed in walls and above ceilings except as specifically indicated otherwise.
8. Ducts, piping, conduit, and equipment concealed in walls and ceilings, unless specifically indicated otherwise.

#### 1.04 REFERENCES

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; 2017, v1.2.
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2008.
- D. EN 15804 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; 2013.
- E. ISO 14025 - Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures; 2006.
- F. ISO 14040 - Environmental management -- Life cycle assessment -- Principles and framework; 2006.
- G. ISO 14044 - Environmental management -- Life cycle assessment -- Requirements and guidelines; 2006.
- H. ISO 21930 - Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services; 2017.
- I. SCAQMD Rule 1113 - Architectural Coatings; 1977 (Amended 2016).
- J. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
- K. SSPC-SP 10 - Near-White Blast Cleaning; 2007.
- L. CFR - Code of Federal Regulations Title 40, Part 60 - Protection of Environment, Standards of Performance for New Stationary Sources.
- M. Factory Mutual - FM Certification of intumescent paint.

- N. Green Seal - GS 11 Green Seal Standard for Paints, Coatings, Stains and Sealers.
- O. Green Seal - GC-03 Green Seal Standard for Anti-Corrosive Paints.
- P. USGBC LEED - LEED v4.1 Green Building Rating System for [New Construction and Major Renovation.
- Q. UL - Underwriters Laboratories Inc. - UL Spot clearinghouse for standards, certifications and Environmental Product Declarations.

### **1.05 SUBMITTALS**

- A. CALGreen Submittals:
  - 1. Product Data for CALGreen 5.504.4.3 - Finish Material Pollutant Control, Paints and Coatings: Product data and material safety data sheets (MSDS) for coatings, including printed statement of chemical composition and VOC content of each product used.
  - 2. Product Data Sheets for each product to be used as proof that each product meets the requirements of either Green Seal's GS-11 or GC-03 documents.
  - 3. Field Verification on on-site product containers: If required by Authority Having Jurisdiction.
- B. Product Data: For each product indicated including block fillers and primers.
  - 1. Provide manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
  - 2. List each material and cross reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
- C. Samples: For each type of paint system and in each color and gloss of topcoat indicated.
  - 1. Submit Samples on rigid backing, 8-1/2 inches by 11 inches.
  - 2. Step coats on Samples to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
  - 5. Do not commence finish painting until approved samples are on file at the job site.

### **1.06 QUALITY ASSURANCE**

- A. Applicator's Qualifications, General: Engage an experienced applicator who has completed painting system applications similar in material and extent.



- B. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use thinners approved by paint manufacturer, and use within recommended limits.
- C. Coordination of Work: Review other Sections in which prime paints are to be provided to ensure compatibility of coatings system for various substrates. Upon request, furnish information or characteristics of finish materials to be used.
- D. Requirements of Regulatory Agencies: Comply with applicable rules and regulations of governing agencies for air quality control.
  - 1. CALGreen: Comply with current applicable regulations of the local air quality district, California Air Resources Board (CARB).
  - 2. Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to start of painting.
- E. Benchmark Samples (Mockups):
  - 1. Provide a full-coat benchmark finish sample for each type of coating and substrate required until required sheen, color and texture is obtained. Simulate finished lighting conditions for review of in-place work.
  - 2. Final colors to be approved by the Architect after a maximum of 3 adjustments to each color at no additional cost.
  - 3. Wall Surfaces: Provide samples at least 100 sq. ft. in area. Apply over specified undercoat utilizing proposed application method for each type of finish.
  - 4. Accent Wall Colors: Paint 3-feet by 5-feet mockup of each accent wall color on wall indicated on finish plan. Paint colors provided in the mockups shall indicate approximate color ranges. Final colors to be approved by the Architect after a maximum of 2 adjustments to each color at no additional cost.
  - 5. Small Areas and Items: Architect will designate items or areas required.
  - 6. Final approval of colors will be from benchmark samples.

#### **1.07 PROJECT CONDITIONS**

- A. Acceptance at Site: Deliver materials to the job site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  - 1. Product name or title of material.
  - 2. Product description (generic classification or binder type).
  - 3. Manufacturer's stock number and date of manufacture.

4. Contents by volume for pigment and vehicle constituents.
  5. Thinning instructions.
  6. Application instructions.
  7. Color name and number
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
- C. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Notify Architect of any existing deteriorated or defective conditions prior to painting and in a timely manner as to not affect the schedule.
- F. Provide barrier coats over incompatible primers or remove and reprime.
- G. Notify Architect of any existing deteriorated or defective conditions prior to painting, in a timely manner as to not affect the schedule. Do not proceed until unsatisfactory conditions are corrected.

#### **1.08 EXTRA MATERIALS**

- A. Upon completion of the work of this Section, remove excess material from the site. No attic stock is required
- B. OR - Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
1. Quantity: 1 gal. of each material and color applied.

### **PART 2 - PRODUCTS**

#### **2.01 SUSTAINABLE MATERIAL REQUIREMENTS**

- A. CALGreen: Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3, shall be determined by classifying the coating as a Flat, Nonflat, or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air

Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

- B. Aerosol paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for VOC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
- C. Refer to Section 01 81 13 - Sustainable Design Requirements for low-emitting materials requirements.

## **2.02 MANUFACTURERS**

- A. Owner's Standards Program: Where applicable, provide products under the terms and conditions of the Owner's standards program; no substitutions.
- B. Manufacturers: Products of the following manufacturers are listed in other Part 2 articles and use the abbreviated names shown in parentheses:
  - 1. Benjamin Moore & Co. (Benjamin Moore).
  - 2. Dunn - Edwards Corporation (Dunn - Edwards).
  - 3. Gemini Coatings (Gemini).
  - 4. Kelly-Moore Paint Co. (Kelly-Moore).
  - 5. Sherwin-Williams Co., The (Sherwin-Williams).
  - 6. United Gilsonite Laboratories (UGL).
- C. Subject to compliance with requirements, provide the named products or comparable products by an accepted equal manufacturer.

## **2.03 PAINT MATERIALS, GENERAL**

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's top-of-the-line-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Colors:

1. Exterior Colors: As affected by exterior work. Field verify existing condition
  - a. PE1: Stain and Seal to match existing
  - b. PE2: Color and Stain to match existing
  - c. PE3: Color to blend with existing
2. Interior Colors: Final color to be selected by Architect from whites or neutral colors.
  - a. P1: Eggshell - at gypsum board wall
  - b. P2: Semi-gloss - above ceramic tile wainscot at Restroom
  - c. P3: (Not Used)
  - d. P4: Flat - at gypsum ceiling

#### **2.04 PREPARATORY COATS**

- A. Crack Fillers: Factory-formulated acrylic emulsion crack fillers compatible with substrate and finish-coat materials indicated.
- B. Typical Exterior Primers: Exterior latex-based primers of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
  1. Ferrous-Metal, Zinc-Coated Metal, and Aluminum Substrates: Rust-inhibitive acrylic metal primer.
    - a. Benjamin Moore; P04 Super Spec HP.
    - b. Dunn - Edwards; WSPR00 WB Syn-Lustro.
    - c. Kelly-Moore; 5725 DTM Primer/Finish.
    - d. Sherwin-Williams; B66-310 ProCryl Universal Metal Primer.
- C. Typical Interior Primers: Interior latex-based primers of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
  1. Gypsum Board Substrates: Zero VOC primer/sealer.
    - a. Benjamin Moore; 372 Eco Spec WB.
    - b. Dunn - Edwards; W600 EcoShield.
    - c. Kelly-Moore; 971 Acry-Plex Zero VOC.
    - d. Sherwin-Williams; B28 ProMar 200 Zero.

2. Ferrous-Metal, Zinc-Coated Metal, and Aluminum Substrates: Rust-inhibitive acrylic metal primer.
    - a. Benjamin Moore; P04 Super Spec HP.
    - b. Dunn - Edwards; UGPR00 Ultra-Grip.
    - c. Kelly-Moore; 5725 DTM Primer/Finish.
    - d. Sherwin-Williams; B66-310 ProCryl Universal Metal Primer.
  3. Wood Substrates (Smooth or Synthetic): Acrylic stain blocking primer.
    - a. Benjamin Moore; 046 Fresh Start.
    - b. Dunn - Edwards; IKPR00 Inter-Kote.
    - c. Kelly-Moore; 255 Acry-Shield.
    - d. Sherwin-Williams; B28W101 PrepRite.
- D. Zinc-Rich Shop Primers for Items indicated to be Painted with High-Performance Coatings:  
As specified in Section 05 50 00 "Metal Fabrications"

## **2.05 EXTERIOR FINISH COATS**

- A. Exterior Wood Stain Finish:
1. For Semi-Transparent Wood Finish: Exterior oil/alkyd wood stain.
    - a. Cabot; 6300 Series.
    - b. Duckback; Superdeck 2100.
    - c. Sherwin-Williams; A15T5 Woodscapes.
- B. Exterior Wood Oil Finish:
1. Cabot; 3400 Series Australian Timber Oil.
  2. Duckback; Superdeck 2500.
  3. Sherwin-Williams; Deckscapes Wood Oil Finish.

## **2.06 INTERIOR FINISH COATS**

- A. Interior Flat Zero VOC/Low Odor Acrylic Paint:
1. Benjamin Moore; 373 Eco Spec WB.
  2. Dunn-Edwards; W601 EcoShield.

3. Kelly-Moore; 1500 Enviro Coat.
  4. Sherwin-Williams; B05 Harmony Flat.
- B. Interior Low-Sheen (Eggshell) Zero VOC/Low Odor Acrylic Enamel:
1. Benjamin Moore; 374 Eco Spec WB.
  2. Dunn-Edwards; W602 EcoShield.
  3. Kelly-Moore; 1510 Enviro Coat.
  4. Sherwin-Williams; B09 Harmony Eggshell.
- C. Interior Semigloss Zero VOC/Low Odor Acrylic Enamel:
1. Benjamin Moore; 376 Eco Spec WB.
  2. Dunn-Edwards; W603 EcoShield.
  3. Kelly-Moore; 1520 Enviro Coat.
  4. Sherwin-Williams; B10 Harmony Gloss.
- D. Interior Wood Stain and Sanding Sealer:
1. Stain:
    - a. Gemini; 6707 Gem-Glo interior alkyd wiping stain.
    - b. UGL; Zar wood stain.
    - c. Sherwin-Williams; Minwax Wood Stain.
  2. Sealer:
    - a. Gemini; WBS-0100 clear waterborne sealer.
    - b. Rust-Oleum; Varathane Diamond 2000.
    - c. Sherwin-Williams; Minwax Clear Sealer.
- E. Interior Satin Wood Varnish: Waterborne, acrylic/urethane.
1. Gemini; WB-0230 waterborne acrylic/urethane clear satin finish.
  2. Rust-Oleum; Varathane Diamond 2002.
  3. Sherwin-Williams; Minwax Polyurethane Varnish Satin.

### **PART 3 - EXECUTION**

#### **3.01 APPLICATION**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
- B. Quality Control
  - 1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
  - 2. Pre-treat and prep wood siding to prevent bleed through of existing wood stain and provide adhesive surface for paint.
  - 3. Slightly vary the color of succeeding coats.
    - a. Do not apply additional coats until the completed coat has been inspected and approved.
    - b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
  - 4. Sand and dust between coats to remove defects visible to the unaided eye from a distance of 5 feet.
- C. Drying
  - 1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suite adverse weather conditions.
  - 2. Consider paint as dry for re-coating when the paint feels firm; does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
  - 3. Protect newly painted surfaces from contact with door seals and similar compressible materials that may adhere to paint and peel it.
- D. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- E. Remove factory-finished hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

- F. Factory primed hardware
  - 1. Paint prime coated hardware to match adjacent surfaces.
  - 2. Paint metal portions of head seals, jamb seals, and astragal seals to match the color of the door frame unless otherwise directed by the Architect.
  
- G. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
    - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
    - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
  - 3. Gypsum Board: Refer to Section 09 21 16 for finishing of new surfaces. At existing gypsum board, repair surface defects using spackling compound. Sand to match existing surface adjacent. Allow to dry completely before priming.
  - 4. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand wood surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b. Prime or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides.
    - c. Rough Sawn Wood Surfaces Exposed to View: Fill holes and defects. Lightly sand but maintain rough sawn appearance to match existing.
    - d. Unless specifically approved by the Architect, do not proceed with painting of wood surfaces until the moisture content of the wood is 12 percent or less as measured by a moisture meter approved by the Architect.
    - e. Apply coats



5. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
    - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
  6. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- H. Material Preparation:
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
- I. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  4. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  5. Paint all gypsum board ceiling, wall, and soffit surfaces above ceilings which can be viewed through open or "gapped" ceiling systems, such as linear wood ceilings, metal mesh ceilings, suspended decorative grid ceilings, and similar open ceiling types.
- J. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brush Applications
    - a. Brush out and work the brush coats onto the surface in an even film.

- b. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
  2. Spray Application
    - a. Except as specifically otherwise approved by the Architect, confine spray application to metal framework and similar surfaces where hand brush work would be inferior.
    - b. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
    - c. Do not double back with spray equipment to build up film thickness of 2 coats in 1 pass.
    - d. Protect all adjacent surfaces, etc. from over spray.
  3. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
  4. Rough Sawn Wood: Back roll and back brush for a uniform finish.
- K. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
  1. Slightly vary the color of succeeding coats.
  2. Do not apply additional coats until the completed coat has been inspected and approved.
  3. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
- L. Exposed Mechanical and Electrical Items: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
  1. Finish electric panels, access doors, conduits, pipes, ducts, grilles, registers, vents, and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.
    - a. Finish surface electrical/telecommunications raceway covers to match the adjacent wall surface. Clean and prime plastic materials to provide proper paint adhesion.
      - 1) Plastic Primer: As manufactured by Kelly-Moore, "KM#287, Kel-Bond Adhesion Plus Primer Sealer".

2. Paint visible duct surfaces behind vents, registers, and grilles flat black. Apply 2 coats of heat resistant paint.
3. Exposed Pipe and Duct Insulation
  - a. Apply 1 coat of latex paint on insulation which has been sized or primed under other Sections; apply 2 coats on such surfaces when unprepared.
  - b. Match color of adjacent surfaces.
  - c. Remove band before painting, and replace after painting.
- M. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- N. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
  1. Omit primer over previously painted surfaces in acceptable condition for re-painting
  2. Omit primer over metal surfaces that have been shop primed and touchup painted.
- O. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
  1. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.

### **3.02 CLEANING AND PROTECTING**

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
- B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### **3.03 WASTE MANAGEMENT**

- A. Set aside extra paint for future color matches, or reuse by Owner. Where paint recycling is available, collect all waste paint by type and provide for delivery to recycling or collection facility.
- B. Close and seal tightly all partly used paint and finish containers and store protected in well ventilated fire-safe area at moderate temperature.
- C. Place empty containers of solvent based paints in areas designated for hazardous materials.
- D. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers for proper disposal.

### **3.04 EXTERIOR PAINT SCHEDULE**

- A. Exterior Wood Finish, Opaque:
  - 1. Walls and Soffits to receive Flat Finish:
    - a. General: Acrylic finish, two finish coats over a primer.
    - b. Primer: Exterior zero VOC/low odor primer as specified for substrate indicated.
    - c. Finish Coats: Exterior low-sheen, VOC/low odor acrylic paint.
- B. Exterior Wood Finish, Stain:
  - 1. Walls and Soffits to receive Stain Finish:
    - a. General: [Transparent] [Semi-Transparent] stain finish.
    - b. Finish Coats: Exterior low-sheen, VOC/low odor stain.
- C. Exterior Wood Finish, Oil:
  - 1. Walls and Soffits to receive Oil Finish:
    - a. General: Transparent penetrating oil finish.
    - b. Finish Coats: Exterior penetrating, VOC/low odor oil.

### **3.05 INTERIOR PAINT SCHEDULE**

- A. Gypsum Board:
  - 1. Walls and Ceilings to receive Flat Finish:
    - a. General: Acrylic finish, two finish coats over a primer.

- b. Primer: Interior zero VOC/low odor primer as specified for substrate indicated.
      - c. Finish Coats: Interior flat zero VOC/low odor acrylic paint.
    - 2. Walls and Ceilings to receive Low-Luster (Eggshell) Finish:
      - a. General: Acrylic finish, two finish coats over a primer.
      - b. Primer: Primer: Interior zero VOC/low odor primer as specified for substrate indicated.
      - c. Finish Coats: Interior low-luster (eggshell) zero VOC/low odor acrylic enamel.
    - 3. Walls and Ceilings to receive Semi-Gloss Finish:
      - a. General: Acrylic finish, two finish coats over a primer.
      - b. Primer: Primer: Interior zero VOC/low odor primer as specified for substrate indicated.
      - c. Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
- B. Metal Doors and Frames, and Other Non-Prefinished Miscellaneous Metal, including Exposed Piping, Conduits, Ductwork, and Other Items:
  - 1. Ferrous Metal:
    - a. Acrylic Finish: Two finish coats over a primer.
      - 1) Primer: Interior primer as specified for substrate indicated (not required on shop-primed items).
      - 2) Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
  - 2. Zinc-Coated Metal:
    - a. Acrylic Finish: Two finish coats over a primer.
      - 1) Primer: Interior primer as specified for substrate indicated (not required on shop-primed items).
      - 2) Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
- C. Typical Exposed Structural Steel Items:
  - 1. Ferrous Metal:
    - a. Acrylic Finish: Two finish coats over a primer.

- 1) Primer: Interior primer as specified for substrate indicated (not required on shop-primed items).
  - 2) Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
2. Zinc-Coated Metal:
- a. Acrylic Finish: Two finish coats over a primer.
    - 1) Primer: Interior primer as specified for substrate indicated (not required on shop-primed items).
    - 2) Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
- D. Wood - Opaque Finish:
1. Acrylic-Enamel Finish: Two finish coats over a primer.
    - a. Primer: Interior primer as specified for substrate indicated.
    - b. Finish Coats: Interior semigloss zero VOC/low odor acrylic enamel.
- E. Wood - Transparent Finish:
1. Miscellaneous Field-Finished Wood:
    - a. Wood Stain: One coat.
    - b. Wood Sanding Sealer: One coat.
    - c. Wood Varnish: Minimum two coats satin varnish.
- F. Wood - Plywood Backboards in Telecommunications Rooms
1. Water-based latex intumescent paint

**END OF SECTION 09 90 00**

## **SECTION 10 11 00 - VISUAL DISPLAY UNITS - SLATWALL PANEL SYSTEMS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. T-Grooved wood composite panel, pre-engineered and machined for use with groove inserts and display hardware
  - 1. Attachment System: Direct fastening of slatwall to wood stud framing.
  - 2. Panels: High Pressure Laminate adhered to wood fiber substrate and having a balancing backer sheet.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.
- C. Section 06 10 00 - Rough Carpentry: Blocking and supports.
- D. Section 06 20 00 - Finish Carpentry: Wood frame and trim

#### **1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- B. Architectural Woodwork Standards as published by the Architectural Woodwork Institute, the Architectural Woodwork Manufacturers Association of Canada, and the Woodwork Institute
  - 1. Architectural Woodwork Standards - Edition 1.

#### **1.04 SUBMITTALS**

- A. CALGreen Submittals: Provide the following:
  - 1. Product Data for CALGreen 5.504.4.1 – Finish Material Pollutant Control; Adhesives, Sealants, and Caulks: For adhesives, sealants, and caulks, including printed statement of VOC content and chemical components.
  - 2. Product Data for CALGreen 5.504.4.5 – Composite Wood Products: For composite-wood products, showing requirements for formaldehyde as specified in Table 5.504.4.
  - 3. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for certified wood and low-emitting materials.

- B. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
  - 1. Preparation instructions and recommendations
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation
- D. Selection Samples: Submit manufacturer's standard color and pattern selection samples representing manufacturer's full range of available colors and patterns.
  - 1. Provide samples of edge trim as applicable.
  - 2. Provide samples for groove insert selection as applicable.
- E. Samples for Verification: Submit sample for each component and for each exposed finish required, prepared on samples of size indicated below complete with exposed molding and trim samples. Sample to indicate type, finish, and color specified.
  - 1. Laminate and printed finishes: Submit 6" (154mm) by 10" (254mm) section of panel for each panel selected indicating the color, texture, and pattern required.
  - 2. Submit complete with specified applied finish.
  - 3. For selected patterns show complete pattern repeat
- F. Maintenance Instructions
- G. Manufacturer's printed installation instructions.

#### **1.05 QUALITY ASSURANCE**

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
  - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
  - 2. Required Rating – Class C.

#### **1.06 WARRANTY**

- A. Standard Warranty



## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Marlite: [www.marlite.com](http://www.marlite.com)
- B. WindMill Slatwall Products: [www. windmillslatwall.com](http://www.windmillslatwall.com)
- C. or equal

### **2.02 PANEL**

- A. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Adhesives and Sealants.
- B. Refer to Section 01 81 13 - Sustainable Design Requirements: Requirements for requirements for low-emitting materials, Composite Wood Products.
- C. Panel Configuration: Engineered groove machined into wood composite substrate.
  - 1. Panel thickness – 3/4" (19mm) thick with nominal 1/2" (13mm) deep slotted groove.
  - 2. Panel face dimensions: 48" (1.22m) by [96" (2.44m)] [As indicated on the drawings].
  - 3. Slatwall panels grooves machined on [3" (76mm) or 4" centers (15mm) ], spacing to match existing slatwood end panels.
- D. High internal bond wood composite substrate.
  - 1. Standard Slatwall, NAF
    - a. Medium density wood fiberboard conforming to ANSI A208.2, industrial-grade MDF and having No-Added Formaldehyde (NAF).
- E. High Pressure Laminate: Vertical grade 0.030" (0.762mm) thick high pressure plastic laminate adhered to wood fiber substrate by cold pressing polyvinyl acetate (PVA) type II, water resistant adhesives
  - 1. Edges - Square, and sealed, 0 half groove with square edge on top and bottom of panel
  - 2. Balancing Backer: Kraft Paper that does not contribute to or pose an unusual additional fire hazard
  - 3. Color and Pattern: Selection from Formica, Wilsonart, Nevamar, and Pionite.
- F. Groove Treatment:
  - 1. Factory installed aluminum Inserts, Color TBD from manufacturer's range.:

G. Panel Trim:

1. Edge – aluminum mill finish, narrow profile;
2. Edge - Wood Profile - 9/16" x 1" x 8'-0" poplar, for field finishing.

**2.03 FABRICATION**

- A. All framing, panels, hardware and accessories shall be factory finished and ready to install except for field fabrication required by perimeter and corner conditions.
- B. Refinish field cut panel edges in accordance with manufacturer's instruction before installation.
- C. Fabrication Tolerances for panels:
1. Dimensional: +/- 0.0625"
  2. Square: +/- 0.125" across diagonals
  3. Thickness: +/- 0.008"
  4. Grooving:: +/- 0.031" (groove width and spacing between grooves)

**2.04 ACCESSORIES**

- A. Installation Accessories.
1. Phillips, bugle head, coarse threaded screws.
  2. Rail Assembly: Combination of Mounting Track and Panel Bar
- B. Signage Holder: Clear acrylic for slatwall
1. Size A: letter size 8-1/2" wide x 11" high; provide (10) quantity
  2. Size B: letter size 11" wide x 8-1/2" high; provide (10) quantity
  3. Confirm ratio of size A and B desired by Library prior to ordering

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as instructed by manufacturer or locate existing studs to receive work.
- C. Installer's Examination: Examine conditions under which construction activities of this section are to be performed. Submit written notification to Architect and system

manufacturer if such conditions are unacceptable. Beginning erection constitutes installer's acceptance of conditions

1. Verify that stud spacing does not exceed 24" (600mm) on-center
2. Verify backing panels are smooth, solid, and flat.

### **3.02 PREPARATION**

- A. Acclimatize wall panels by removing from packaging in installation area not less than 72 hours before application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Except as directed by the architectural drawings, before installing, examine panels and arrange to achieve best combination of color, pattern, texture and grain.

### **3.03 INSTALLATION**

- A. Install all materials in strict accordance with the manufacturer's installation instructions with hardware straight, plumb, and level.
  1. Anchor units rigidly and securely in place.
  2. Cut sheets to meet existing supports
- B. Avoid contamination of the panel faces with adhesives, solvents or cleaners during installation.
- C. Fasten initial bottom panel to the wall with #6 or #7 bugle head drywall screws. Install a minimum of one screw every third slot (or 9" (228mm)) vertically and every stud horizontally, typically every 16" (40.64cm) on centers horizontally (maximum 24" (600mm) on centers horizontally). Each 4' x 8' panel shall have minimum of 42 screws secured to studs or furring.
  1. Where screws do not hit the studs, fasten with adhesive in accordance with the manufacturer's recommendations.
  2. Screws must be installed thru the panel grooves
  3. Slatwall panels without inserts do not require pre-drilling.
  4. Slatwall panels with inserts require 5/32" pre-drilling of holes thru the insert and panel before fastening.

### **3.04 CLEANING**

- A. Clean and remove dust and other foreign matter from panel and framing surfaces. Clean finishes in accordance with manufacturer's instructions.

Permit Submittal  
Project No. 10-19

Petaluma Regional Library Renovation  
Petaluma, California

**END OF SECTION**

## **SECTION 10 14 00 - SIGNAGE**

### **PART 1 GENERAL**

#### **1.01 RELATED SECTIONS & REFERENCE**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Manufacturer shall be responsible for providing Signage and Graphic Products that comply with the documents listed below. If newer versions of these documents are in effect at the time of installation, then the Manufacturer is responsible for compliance with the newer versions.
  - 1. 2019 California Building Code (CBC).
  - 2. State of California, California Code of Regulations, Title 24, Volumes 1 and 2.
  - 3. California Department of General Services, Division of the State Architect, 2019 California Access Compliance Advisory Reference Manual.
  - 4. County of San Mateo Municipal Code.
  - 5. Americans with Disabilities Act (ADA) legislation, published in the Department of Justice Federal Register.
  - 6. "ADA Standards for Accessible Design", 2010.
  - 7. "Instruction Manual for Braille Transcribing" Sixth Edition, 2013, National Library Service for the Blind and Physically Handicapped, Library of Congress, <http://www.loc.gov>.

#### **1.02 SUBMITTALS**

- A. Pre-submittal Conference: Coordinate with the Owner's Representative prior to preparation of submittals to confirm submittal requirements and schedule. All items listed are required unless instructed otherwise by the owner, or the owner's representative.
- B. Product Data: Submit manufacturers' catalog sheets, brochures, diagrams, schedules, charts, illustrations, test results and/or other standard descriptive data.
  - 1. Mark up each copy to identify pertinent materials, products or models.
  - 2. Show dimensions and clearances required, performance characteristics and capacities, and wiring diagrams and/or controls as apply.
  - 3. Submit materials descriptions and finishes for each type of sign.
- C. Shop Drawings:

1. All shop drawings shall be neat, well organized and clearly legible. Elevations and plan views from the Construction Drawings may be reproduced for the sake of expedience where appropriate
2. All shop drawings shall be drawn to scale and not subsequently reduced to fit a drawing format.
3. Submit elevations and plan views for all sign types, including graphic layouts, complete dimensions, materials, locations of all exposed fasteners, colors and finishes. Determine the total quantity for each sign type and note it in the shop drawings
4. Submit comprehensive section drawings for sign types where applicable, including sections of all typical members. Show fabrication and installation details, including details for securing members to one another, to building structures, and/or to site work. Show interior construction, reinforcements, anchorages, components and finishes. Site Condition Verification: sign fabricator shall inspect site to confirm installation conditions, then submit shop drawings and/or written documentation for approval indicating proposed mounting devices.
5. Sign Location Plan: Submit floor plan drawings showing location and sign type for each sign.
6. Sign Message Schedule: Submit spreadsheet in native Excel format indicating floor level, sign location number, sign type, quantity, sign message, and remarks.

D. Samples:

1. Color and Finish: Submit 3 each, 6 inch x 6 inch samples of all paint colors, screen colors, vinyl colors and material finishes. All paint and screen colors are to be applied to the appropriate substrate. Vinyl colors are to be trimmed directly off the roll and provided on the original liner.
  - a. Sign fabricator to submit verification of paint manufacturer used for submittal.
  - b. Prior to submittal, sign fabricator shall verify that all colors submitted as samples match accurately the samples or specifications provided by Owner's Representative.
2. Typeface(s): Submit complete typeface font(s), including upper and lower case letters, numbers and punctuation, for all typeface(s) specified. Also submit samples of letter and word spacing for each cap height specified.

E. Prototypes:

1. Submit one full-size complete prototype each for the following Sign Types:
  - a. Exact sign types for prototypes to be determined by the Owner's Representative and sign programmer.

- b. Substitutions, deletions, or additions to be determined by the Owner's Representative on a project by project basis.

F. Quality Control:

1. Samples, mock-ups and prototypes shall not be permanently installed, but shall be retained by the Owner's Representative for record and quality control, unless otherwise noted by the Owner's Representative.
2. If requested by Owner's Representative, submit manufacturer's installation instructions for each type of specialty sign. Include only pages which are pertinent, or manufacturer's standard drawings modified to delete non-applicable data.

### 1.03 QUALITY ASSURANCE

- A. Call specific attention to any construction details, materials, methods of fabrication or other similar items which they consider to be impractical or not in keeping with good industry practice. Requests for change orders for substitutions to address such items after award of contract shall not be accepted.
- B. Do not scale drawings for dimensions. Use only the written dimensions indicated on the Drawings, unless such be found in error. Sign Fabricator shall verify and be responsible for all dimensions and conditions shown by the Drawings, and shall visit the site to inspect and verify field conditions prior to fabrication and installation. The Owner's Representative shall be notified, in writing, of all discrepancies on Drawings, in field dimensions or conditions, and of changes required in construction details.
- C. Provide each type of sign as a complete unit produced by a single manufacturer, including all required mounting accessories, fittings and fastenings.
- D. All details shown in the Drawings shall be followed for exterior appearance. Minor changes in interior construction will be accepted in order to conform to Sign Fabricator's shop practices or engineering requirements when, in the sole judgment of the Owner's Representative, such changes do not detract materially from design concept or intent. Sign Fabricator shall circle all such changes on the shop drawings.
- E. Completed work shall be structurally sound, and free from scratches, distortions, chips, breaks, blisters, holes, splits or other disfigurements considered as imperfections for the specific material.
- F. Tactile signs shall be field inspected after installation per CBC Chapter 11B-703.1.1.2.

## PART 2 – PRODUCTS

### 2.01 MANUFACTURERS

- A. Acceptable sign fabricators must meet following expectations:

1. A thorough description of three architectural signage projects, similar in character and scope to this project, which have been completed by the Bidder within the past three years. Note specifically any and all work performed by subcontractor(s) and identify subcontractor(s) for each subcontracted portion of the work. Include photographs, brochures, shop drawings or other relevant exhibits. Provide name, address and telephone number for client contact for each project.

## 2.02 MATERIALS

### A. Tactile Signs (Exterior Grade):

1. Provide exterior grade light-sensitive photopolymer layer of PVA/urethane base composition, manufactured to produce an etched surface with 1/32" relief copy and/or Braille dots after exposure to ultraviolet light, and with a minimum 95 Shore D durometer hardness rating. Photopolymer to be processed and baked to factory specifications only. Wash and post-wash exposed materials in accordance with manufacturer's instructions. Contact Nova Polymers at [www.novapolymers.com](http://www.novapolymers.com), or call (888) 484-6682. Foil stamping is an acceptable substitution.
2. Sign Face Primer: Provide Matthews #74-777 Tie Bond.
3. Sign Face Topcoat : Provide Matthews Acrylic Polyurethane.
4. Text and/or Graphics Finish: Provide multiplastic or other paint silkscreened for high adhesion. Coating shear lines to precisely reflect letterforms and/or graphic outline contours. Foil Stamping is an acceptable option.
5. Protective Sign Finish: Provide Matthews the State in which the Project is located A-4158 ADA clear, applied per manufacturer's instructions.

### B. Braille:

1. Sign fabricator shall be responsible for the accurate translation of all applicable tactile copy to Contracted Grade 2 Braille that shall comply with CBC Sections 11B-703.3 and 11B-703.4.
2. Braille dots shall have a domed or rounded shape and shall comply with Table 11B703.3.1.
3. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.
4. Measurement ranges are as follows. Dot base diameter: 0.059 (1.5 mm) to 0.063 (1.6 mm). Distance between two dots in the same cell: 0.090 (2.3 mm) to 0.100 (2.5 mm). Distance between corresponding dots in adjacent cells: 0.241 (6.1 mm) to 0.300 (7.6 mm). Dot height: 0.025 (0.6 mm) to 0.037 (0.9 mm). Distance between corresponding dots from one cell directly below: 0.395 (10 mm) to 0.400 (10.2 mm).



5. Braille shall be in a horizontal format.
  6. Braille shall be positioned below the corresponding text. If text is multi-lined, braille shall be placed below the entire text. Braille shall be separated 3/8 inch (9.5 mm) minimum and 1/2 inch (12.7 mm) maximum from any other tactile characters and 3/8 inch (9.5 mm) minimum from raised borders and decorative elements.
- C. Fasteners, Hardware and Devices: Stock proprietary fastening devices of approved standard manufacture such as cadmium plated screws, bolts and washers, and stainless steel hinges.
1. Conceal all fasteners except where noted or shown otherwise.
  2. Finish on all exposed devices to match overall sign finish unless otherwise noted.
  3. Provide vandal-resistant fasteners at all exposed locations unless otherwise noted.
  4. Use fasteners fabricated from metals that are noncorrosive to either the sign material(s) or the mounting surface.
- D. Very High Bond Tape: Provide #4905/.020"/clear and/or #4950/.045"/white closed cell acrylic foam carrier with VHB adhesive, very high solvent resistance and very high shear and peel adhesion, as manufactured by 3M Scotch or approved equal.
- E. Acrylic Polyurethane Paint:
1. Provide acrylic polyurethane with ultraviolet inhibitors and lightfast, weather, abrasion and graffiti resistant additives as manufactured by Matthews Paint Company (800) 323-6593. Prime and finish coats shall be mixed and applied in accordance with manufacturer's specifications. Paint finish shall be smooth, free of scratches, gouges, drops, bubbles, thickness variations, foreign matter or other imperfections.
    - a. Provide a CCR Title 24 compliant non-glare finish for all interior applications.
    - b. Provide a semigloss finish for all exterior applications.
  2. Colored Coatings for Cast Acrylic Sheet: Use paints for background color which are recommended by acrylic manufacturer for optimum adherence to acrylic surfaces and are non-fading for application intended.
  3. Provide verification of paint manufacturer used for all paint work.
- F. Silicone Adhesive: GE Momentive RTV6708 Clear Silicone Adhesive, or approved equivalent.

### **2.03 FABRICATION**

- A. Intent of Specifications: All finished work shall be of the highest quality in order to pass eye-level examination and scrutiny by Owner's Representative.

1. All Work shall be free from burrs, dents, raw edges and sharp corners.
  2. Finish all welds on exposed surfaces as required so they are not visible in the finished work.
  3. Finish all surfaces smooth unless otherwise indicated or specified.
  4. Surfaces which are intended to be flat shall be free from bulges, oil canning, gaps, or other physical deformities. Such surfaces shall be fabricated to remain flat under installed conditions.
  5. Fabricate all cabinets, panels and components with smooth, mechanically finished edges. All edges shall be true, and all corners shall be square. Where edges are specified to be painted, fill and sand smooth as required prior to painting.
  6. Cut routed letterforms and/or graphics clean and true to match adjacent surface-applied letterforms and/or graphics.
  7. Exercise care to protect all polished and/or plated surfaces so that they remain unblemished in the finished work.
  8. Isolate dissimilar materials. Exercise particular care to isolate nonferrous metals from ferrous metals as required to prevent corrosion.
  9. All surfaces shall be flat to a tolerance of plus or minus 1/16" when measured at any point with a ten-foot straightedge.
  10. All visible sign surfaces of the same type shall have the same finish. Color and/or finish shall be consistent across the entire surface of a sign.
  11. All reveals shall be of uniform width; all butt joints shall be tight and closed along the entire length.
  12. All gaps between milled components, when assembled, shall not exceed a tolerance of .005".
- B. Provide colors and/or finish textures as specified or indicated in the drawings or, where not specified or indicated, as selected by the Owner's Representative.
1. Interior Colors/Finishes: Colors of sign graphics (text, arrows and/or symbols) shall have a minimum of 70% contrast with sign background behind graphics. Finish shall be nonglare on all sign backgrounds behind graphics on identification and directional signs.
- C. Graphics: All text, arrows and symbols shall be provided in the sizes, colors, typefaces and spacing specified in the drawings. All text shall be a true, clean, digitally or photomechanically accurate reproduction of the typefaces specified with letterspacing and directional arrows as shown in the drawings.

1. Lettering: Custom Typography: Per Owner approved fonts.
- D. Sign Schedule: Copy shown in the drawings is for layout purposes only; all final copy, quantities and references for all signs are shown in the Sign Schedule unless otherwise noted. The Sign Fabricator shall clarify any perceived irregularities in the Sign Schedule with the Owner's Representative prior to fabrication.

### **PART 3: EXECUTION**

#### **3.01 INSPECTION**

- A. Owner's Representative reserves the right to inspect the Work in the Sign Fabricator's shop before it is shipped to the job site for installation.
- B. Sign Fabricator shall inspect all installation locations for conditions that will adversely affect the execution, permanence and/or quality of the Work, and notify Owner's Representative in writing of any and all unsatisfactory conditions. Sign Fabricator shall not proceed with installation until said unsatisfactory conditions have been corrected. Commencement of installation indicates acceptance of site conditions and guarantees delivery of an acceptable product.
- C. Signs and identification devices shall be field inspected after installation and approved by the enforcing agency prior to the Final Completion. The inspection shall include, but not be limited to, verification that braille dots and cells are properly spaced and the size, proportion and type of raised characters are in compliance with these regulations.

#### **3.02 SIGN LOCATIONS**

- A. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest Braille cells and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest line of raised characters as per CBC 11B-703.4.
- B. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall.
- C. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. Where permanent identification signage is provided for rooms and spaces, they shall be located on the approach side of the door as one enters the room or space. position. Signs that identify exits shall be located on the approach side of the door as one exits the room or space.

- D. Symbols on restroom doors shall be located in compliance with CBC 11B-703.7.2.6: Center of sign to be 60 inches above finished floor. Sign to be centered left to right on the door.

### **3.03 INSTALLATION**

- A. For ADA Signs: ADA sign are to mounted 60” to top of sign, centered on 18” from edge of door on the latch side, so that a person may approach without encountering protruding objects within the door swing. If no space is available on the latch side of the door the sign can be placed on the opposite side of the door as stated above. Tactile copy baseline and Braille copy are to be placed no higher then 60” to the baseline or 48” to the bottom of the Braille copy.
- B. Pre-installation Walkthrough: Attend a pre-installation walkthrough at the job site to confirm all typical installation conditions and determine installation locations for nontypical conditions.

### **3.04 SITE CLEANUP**

- A. Final cleanup:
  - 1. Clean and/or repair all evidence of installation work or damage to site work or other adjacent surfaces prior to completion of work.
  - 2. Clean up work area after all installation has been completed. Restore all disturbed ground cover.
  - 3. Remove all protective materials and dispose of properly off site.

### **3.05 CLEANING AND PROTECTION**

- A. At completion of installation, clean all sign surfaces in accordance with manufacturer’s instructions.
- B. Protect all signs from damage until acceptance by Owner’s Representative; repair or replace damaged units as required.
- C. Clean and/or repair all evidence of installation work or damage to adjacent surfaces prior to completion of work.
- D. Remove all protective materials and dispose of properly off site.

### **3.06 LIMITED ONE-YEAR WARRANTY**

- A. The fabricator shall warranty any defect due to faulty material or workmanship for one year from date of invoice. The fabricator shall repair or replace the product without charge, providing it has been installed according to design and installation specifications. The fabricator shall be responsible for removal and reinstallation costs of said product.

**3.07 CONTRACT CLOSE-OUT ITEMS**

- A. Provide Owner with written instructions for proper cleaning of the signs, including cleaning solution, tools, and/or materials. Note any solvents that should not be used.

**END OF SECTION**

## **SECTION 10 21 13.17 - PHENOLIC TOILET COMPARTMENTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Compact Laminate Phenolic toilet compartments.
- B. Urinal screens.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 06 10 00 - Rough Carpentry: Blocking and supports.
- C. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

#### **1.03 SUBMITTALS**

- A. Product Data: Provide data on panel construction, hardware, and accessories.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Samples: Submit two samples of partition panels, 4 inch in size illustrating panel finish, color, and sheen.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Phenolic Toilet Compartments:
  - 1. Basis of Design: Bobrick; CGL Phenolic Duraline Series, or equal.

#### **2.02 COMPACT GRADE LAMINATE TOILET COMPARTMENTS**

- A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solidly fused compact grade laminate with matte melamine surfaces, colored faced sheets, and black phenolic-resincore panels that are integrally bonded, Floor-to-Ceiling and Overhead braced. Match existing condition, if feasible. ASTM E 84 Class A fire rating
  - 1. Color: Wilsonart; Highrise.- custom laminate
  - 2. Height :
    - a. Men's and Women's Restrooms: Standard privacy height panel with 12" floor clearance. Meet CBC 11B-604.8.1.4 toe clearance. Series 1180

- b. Gender Neutral Restrooms: Extended privacy height panel. Series 3180; 1" floor clearance
- 3. Gap:
  - a. Men's and Women's Restrooms: Standard reduced gap, +/- 3/32" door to stile gaps, 1/2" to 1" wall gaps.
  - b. Gender Neutral Restroom: Gap-free doors & Stiles - sightline free - interlocking design routed 5/16" from edge to allow for overlap
- B. Doors:
  - 1. Thickness: 3/4 inch.
  - 2. Width: 24 inch.
  - 3. Width at Accessible Compartment: 34" min. clr access, 36 inch.
  - 4. Height: 58 inch for Standard Privacy; 73" to 96" for Extended Privacy with 1" floor clearance and 1" minimum clearance from headrail
- C. Panels:
  - 1. Thickness: 1/2 inch.
  - 2. Height: 58 inch for Standard Privacy; 73" to 96" for Extended Privacy with 1" floor clearance and 1" minimum clearance from headrail
- D. Pilasters:
  - 1. Thickness: 3/4 inch.
  - 2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with continuous panel brackets with vertical support/bracing same as compartments.

### 2.03 ACCESSORIES

- A. Wall and Pilaster Brackets: Polished stainless steel; continuous type. heavy duty stainless steel.
- B. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.
- C. Hardware: Type 304, Satin stainless steel:
  - 1. Standard concealed barrel hinges. Balanced, field adjustable cam to permit door to be fully closed when compartment is unoccupied. Self-Closing.

- a. Comply with CBC 11B-604.8.1.2 for self-closing requirement.
2. Door Latch: Slide type. Track of door latch prevents inswing doors from swinging out beyond the stile. 16 gauge sliding door latch, 14 gauge keeper.
  - a. Comply with CBC 11B-309 such operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of wrist. Force to activate operable parts shall be 5 pounds. max.
  - b. Hardware option: Occupancy Indicator Latch
3. Locking: Door locked from inside by sliding door latch into keeper.
4. Occupancy Indicator Latch: Indicator latch with emergency access feature.
5. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
6. Coat hook with rubber bumper; one per compartment, mounted on door. Mount at 48" max. Projects no more than 1-1/8" from face of door.
7. Door pull on both sides of door near latch. Pull is open loop, wire pull type.
  - a. Comply with CBC 11B-404.2.7 and CBC 11B-309.4. Operable parts to be mounted at 36" high (34 inches min, 44 inches max per CBC 11B-404.2.7)
8. Barrel Hinges at Extended Privacy Partitions: Four barrel-type hinges with adjustable cam for fully closed or partially open
9. Door stop: Mounted to door

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

#### **3.02 INSTALLATION**

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.



- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

### **3.03 TOLERANCES**

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

### **3.04 ADJUSTING**

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

**END OF SECTION**

## **SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Commercial toilet accessories.
- B. Under-lavatory pipe supply covers.
- C. Diaper changing stations - remove and provide new
- D. Remove and re-install existing toilet accessories as shown on Drawings to compliant height and dimensions
- E. Combination Towel Dispenser/Waste Receptacle

#### **1.02 RELATED REQUIREMENTS**

- A. A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 06 10 00: Concealed supports for accessories, including in wall framing and plates.
- C. Section 09 30 00 - Tiling: Ceramic wall tile.
- D. Section 10 21 13.17 Phenolic Toilet Compartments

#### **1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.
- C. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.
- G. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.
- H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

#### **1.04 SUBMITTALS**

- A. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Commercial Toilet, Shower, and Bath Accessories:
  - 1. American Specialties, Inc: [www.americanspecialties.com/#sle](http://www.americanspecialties.com/#sle).
  - 2. Bradley Corporation: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
  - 3. Bobrick; [www.bobrick.com](http://www.bobrick.com).
  - 4. Buckeye International Inc. [www.buckeyeinternational.com/](http://www.buckeyeinternational.com/)
- B. Under-Lavatory Pipe Supply Covers:
  - 1. Plumberex Specialty Products, Inc: [www.plumberex.com/#sle](http://www.plumberex.com/#sle).
- C. Electric Hand/Hair Dryers: Remove at locations indicated.
- D. Baby Changing Stations: Surface mounted. - stainless steel
  - 1. Bobrick, Inc; Koala Kare Products: [www.koalabear.com/#sle](http://www.koalabear.com/#sle)
  - 2. Bradley Corporation; \_\_\_\_\_: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
  - 3. American Specialties, Inc;[\_\_\_\_\_]: [www.americanspecialties.com/#sl](http://www.americanspecialties.com/#sl)
- E. Paper Towel Dispenser adn Waste Receptacle: Recessed
  - 1. Bobrick; [www.bobrick.com](http://www.bobrick.com)
  - 2. Bradley Corporation; [www.bradleycorp.com](http://www.bradleycorp.com)

#### **2.02 MATERIALS**

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

- B. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- C. Zinc Alloy: Die cast, ASTM B86.
- D. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- E. Adhesive: Two component epoxy type, waterproof.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

### **2.03 FINISHES**

- A. Stainless Steel: Satin finish, unless otherwise noted.

### **2.04 Commercial Toilet Accessories**

- A. Remove and reinstall existing accessories at locations indicated unless otherwise specified.
- B. Combination Towel Dispenser and Waste Receptacle: Recessed flush with wall, stainless steel; seamless wall flanges, continuous piano hinges, fit between stud spacing. minimum 3.7-gal waste container. 600 c fold or 800 multifold paper towels.
  - 1. Products:
    - a. Bobrick; B-83034
    - b. Bradley; 2027
    - c. American Specialties; 6467
    - d. or equal
- C. Toilet Paper Dispenser: Double roll, surface mounted,
  - 1. Products:
    - a. Bobrick; B-2888.
    - b. Bradley; 5402.
    - c. American Specialties; 20030
    - d. or equal
- D. Soap Dispenser: Liquid soap dispenser, wall-mounted, with \_\_\_\_\_ cover and window to gauge soap level user selective lock.
  - 1. Minimum Capacity: 1250m.
  - 2. Products:

- a. Buckeye; Symmetry Stealth Prestige 1250ml; 99602001. Matching existing.
- E. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
  - 1. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
  - 2. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
- F. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base, 250 single or half fold toilet covers or one box.
  - 1. Products:
    - a. Bobrick; B-221.
    - b. Bradley; 5831
    - c. American Specialties; 0477-SM
    - d. or equal
- G. Grab Bars: Stainless steel, smooth surface.
  - 1. Standard Duty Grab Bars:
    - a. Push/Pull Point Load: 250 pound-force, minimum.
    - b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    - c. Length and Configuration: As indicated on drawings.
- H. Purse Shelf: Fold-down, with spring-loaded hinge designed to automatically return shelf to vertical position when not in use; 0.03 inch satin-finished stainless steel, with 1/4 inch rolled or 1/2 inch channel edge at shelf front.
  - 1. Products:
    - a. Bobrick; B-287.
    - b. Bradley; 790.
    - c. American Specialties; 0698.
- I. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

1. Products:
  - a. Bobrick; B-270.
  - b. Bradley; 4A10.
  - c. American Specialties; 0852.
  
- J. Clothes Hook: Stainless steel, surface mounted to door of single occupancy gender neutral restrooms.
  1. Products:
    - a. Bobrick; B-233
    - b. Bradley; 917
    - c. American Specialties; 8425

## **2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS**

- A. Under-Lavatory Pipe and Supply Covers:
  1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
  2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
  3. Construction: 1/8 inch flexible PVC.
    - a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
    - b. Microbial and Fungal Resistance: Comply with ASTM G21.
  4. Color: White.
  5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
  6. Products:
    - a. Plumberex Specialty Products, Inc; Plumberex Handy-Shield Maxx:  
[www.plumberex.com/#sle](http://www.plumberex.com/#sle).

## **2.06 Diaper Changing Stations**

- A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.

1. Mounting: Surface mounted.
2. Color: Stainless Steel
3. Minimum support static load: 200 pounds.
4. Products:
  - a. Koala Kare; KB310-SSWM .
  - b. Bradley: 962-11.
  - c. or equal

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work. Carefully remove existing units indicated to be removed and reinstalled to avoid distortion of components and damage to finishes.
  1. If accessories indicated to be removed and reinstalled are damaged, or if components required for reinstallation are missing, notify the Architect immediately.
  2. Furnish new fasteners.
- B. Verify exact location of accessories for installation and install new blocking and backing so that units can be reinstalled at required heights and locations.

#### **3.02 PREPARATION**

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

#### **3.03 INSTALLATION**

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
  1. Grab Bars: As indicated on drawings.
  2. Mirrors: 40 inch, measured from floor to bottom of mirrored surface.
  3. Other Accessories: As indicated on drawings.

**3.04 PROTECTION**

- A. Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION**



## **SECTION 11 00 20 - FURNISHED, CONTRACTOR-INSTALLED (CFCI) EQUIPMENT**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Provide the requirements of this Section when providing miscellaneous Contractor-furnished, Contractor-installed (CFCI) equipment, as follows:
  - 1. Thru-wall book return.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 06 10 00 – Rough Carpentry for wood blocking for anchoring miscellaneous CFCI equipment.

#### **1.03 SUBMITTALS**

- A. Product data: For each type of product.
  - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each equipment item.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: Include plans, elevations, sections, details, mounting heights, and attachments to other work.
- C. Informational Submittals:
  - 1. Qualification Data: For installer and manufacturer.
  - 2. Sample Warranties: For manufacturers' special warranties.
- D. Closeout Submittals:
  - 1. Operation and Maintenance Data: For each equipment item, to include in operation and maintenance manuals.

#### **1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for
  - 1. installation and maintenance of units required for this Project.

## **1.05 WARRANTY**

- A. Special Warranties for Miscellaneous CFCI Equipment: Manufacturer agrees to repair or replace miscellaneous CFCI equipment items or components that fail in materials or workmanship within specified warranty period.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Accessibility: Where miscellaneous CFCI equipment items are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design, ICC A117.1, and the California Building Code

### **2.02 THROUGH-WALL BOOK RETURN**

- A. Basis-of-Design Product: The design for through-wall book returns is based on the Kingsley Company's "Kwikdrop No. 10-8951"
- B. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. American Book Returns.
  - 2. Bretford, Inc.
  - 3. Equal.
- C. Features:
  - 1. Heavy-duty stainless-steel exterior faceplate.
  - 2. Stainless-steel depository door flap, and built in weather hood. Caulking on inside edges of faceplate and weather stripping around door for increased protection from weather.
  - 3. Spring loaded depository door
  - 4. Chute housing with entry chute and slide chute.
  - 5. Air draft prevention system of neoprene rubber panels to eliminate drafts when depository door is opened.
  - 6. Upward angle of external shroud, length of internal slide chute and draft prevention system to prevent removal of materials from chute.
  - 7. Locking mechanism, operable from inside with open/close lever
  - 8. Self adhesive vinyl decal, including Braille tags for BOOKDROP.

- D. Accessories: Provide all additional accessory items as required for a complete installation.
- E. Depository Door Wording: "BOOK RETURN" , or as otherwise selected by the Owner. Final wording to be determined. Silkscreen application.
- F. Size:
  - 1. Overall: 20 inches wide by 17-3/16 inches deep by 18-3/16 inches high
  - 2. Depository Opening: 15-1/8 inches wide by 3-7/8 inches high..

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of miscellaneous CFCI equipment.
- B. Examine roughing-in for piping, electrical, mechanical, and other utility systems to verify actual locations of connections before equipment installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance.
- D. Proceed with installation only after unsatisfactory conditions have been corrected

#### **3.02 INSTALLATION**

- A. Install miscellaneous CFCI equipment according to manufacturer's written instructions. Coordinate thru-wall bookdrop with existing Owner furnished book rolling carts. Confirm that rolling carts will fit under bookdrop unit.
- B. Install level, plumb, and true and securely fastened. Mount at accessible compliant mounting height.
- C. Install equipment in locations indicated.
- D. Built-in Equipment: Securely anchor units to supporting substrates, including cabinets and countertops, with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- E. Touch up and restore any factory finishes partially damaged or defaced during delivery, relocation, and installation to leave in condition acceptable to Architect.
  - 1. Replace any item not found acceptable following touch-up and restoration at no increase in Contract Sum

#### **3.03 ADJUSTING AND CLEANING**

- A. Following installation, clean equipment in accordance with manufacturers' instructions.

- B. Remove packing materials and other debris, and leave units in clean condition, ready for operation.
- C. Test each item to verify proper operation. Make necessary adjustments.
- D. Verify that accessories required have been furnished and installed.

**END OF SECTION**

## **SECTION 11 51 23 - LIBRARY STACK SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Fixed, Steel Bracket Shelving: Cantilevered, steel bracket-type library stack shelving systems, including custom-fabricated end panels, canopy tops and other fabrications
- B. Mobile Shelving Units: Cantilevered, steel bracket-type library stack shelving with concealed caster units, and including custom-fabricated end panels, canopy tops, and other fabrications
- C. Display Bookshelf
- D. Tiered Mobile Book Display
- E. Salvage existing end panels (white slat) on existing library shelving system for re-installation at new library shelving units

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.03 ACTION SUBMITTALS**

- A. Product Data: for each type of product specified.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for library stack systems and accessories.
- B. Shop Drawings: Show actual field dimensions, complete shelving layout, relationship and connections to structure, and details of erection and assembly. Identify shelving by types as indicated. Reference Architect's shelving type designation. Provide elevations of each shelving type in compliance with height, width, number, and type of shelves specified as well as coordination of canopy tops and end panels.
- C. Structural Design Calculations: Retain and pay for services for qualified professional engineer to prepare calculations and drawings for specified systems, acceptable to authorities having jurisdiction, including all connections between members of system and all connection to existing building structure.
  - 1. Submit calculations of seismic forces for fully loaded bookstacks, clearly indicating compliance with seismic design requirements. Cross-reference calculations to applicable shop drawing details. Base calculations on upright of fully loaded shelves.
  - 2. Provide elevations of each type of fixed and mobile shelving units showing dimensions pursuant to the following:

- a. Number of shelf openings
  - b. Clearances between shelves
  - c. Clearance between uprights and usable shelf depth.
- D. Samples: Submit 6-inch square samples of painted metal, in color as specified by Architect.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Manufacturer and Supplier/Installer.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of steel bracket shelving used.
- C. Seismic Certificate: Submit detailed certification by structural engineer licensed in California indicating system complies with applicable codes and Contract Documents for seismic design.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Manufacturer's Instructions: Manufacturer's installation instructions.
- B. Warranty: Special warranty specified in this Section.
- C. Maintenance Data: For library stack systems to include in maintenance manuals.

#### **1.06 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Shelf Units for Fixed Shelving: 10 shelves of each specified depth.
  2. Shelf Units for Movable Shelving. 10 shelves of each specified depth.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Provide library shelving by one manufacturer for entire Project with minimum five years successful experience in manufacture of shelving comparable to those required.
- B. Installer Qualifications: Firm acceptable to manufacturer and with minimum five years successful experience in installation of shelving systems comparable to those required.
  1. Installer shall have Class C-61 Limited Specialty Contractor license.
  2. Experienced in installation of shelving for projects of scope comparable to that of this Project within last 5 years and able to document experience of 3 such projects by listing project locations, their construction costs, and names and addresses of their

Owners, Owner's representatives, or Contractors who will attest to supplier/installer's record of cooperation with the Architect and Contractor.

- C. Source Limitations: Obtain library stack system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of library stack systems and are based on the specific system indicated.
  - 1. Do not modify requirements, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver library stack system and equipment to Project site when spaces to receive them have been completed, including finish flooring installation.
- B. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.
- C. Label factory packages to indicate contents.
- D. Unload materials carefully and store on clean, dry surface or raised platform in safe area protected from weather.

#### **1.09 SITE CONDITIONS**

- A. Environmental Limitations: Do not deliver or install library stack system until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Indicate measurements on Shop Drawings

#### **1.10 WARRANTY**

- A. Submit a written warranty, executed by Contractor, Installer and Manufacturer, agreeing to repair or replace.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace units that fail in materials, fabrication, or installation within the specified warranty period. This warranty shall be in addition to, not limitation of other rights the Owner may have against the Contractor under Contract Documents.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.

- b. Failure of operating components.
- c. Deterioration of metals, metal finishes, and other materials beyond normal wear.
- 2. Warranty Period: Five years from date of Substantial Completion for defects in materials.
- 3. Warranty Period: One year from date of Substantial Completion for fabrication and installation.

### **1.11 SEQUENCING AND SCHEDULING**

- A. Coordinate erection with requirements of related work.
- B. Coordinate with work occurring under other Contracts performed at the site.
  - 1. Petaluma Library Refresh - Renovation project
  - 2. Petaluma Library Refresh - Furniture

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS, GENERAL**

- A. Performance Requirements:
  - 1. Seismic Performance: Provide library stack systems capable of withstanding the effects of earthquake motions determined according 2019 California Building Code requirements.
  - 2. Shelving shall conform to 2019 CBC Requirements as applicable.
    - a. Seismic Design Category: D
    - b.  $Le=1.25$
    - c.  $Lp=1.0$
  - 3. Design all components and connections of metal shelving systems, including anchorage to structure to resist seismic forces.
  - 4. Design load shall be in accordance with CBC of 50 psf per shelf.
  - 5. Assume fixed shelving installation over carpet tile, over concrete floor.
  - 6. Anchor fixed shelving system using drilled-in expansion bolts at ICC approved allowable capacities.
- B. Design:



1. Welded frame every other unit and starter and adder combinations are not acceptable.
  2. Commercial and case type shelving shall not be considered.
  3. Modular Construction: Components of stack system may be divided for rearrangement without procuring additional components.
  4. Bracing that prevents insertion of oversize material (past center line) on any base or adjustable shelf is not acceptable.
  5. Completed Installation: Neat and finished appearances, free of exposed sharp edges and projections.
- C. Design system, including columns, bases, connections, and anchorages, capable of resisting lateral seismic force of  $FR+0.30 W_p$  in any direction, acting simultaneously with vertical seismic force equal to one third of horizontal force  $F_p$ .
1. Allowable stresses and other design criteria shall be as permitted by referenced code.
  2.  $W_p$  is defined as the total weight of the shelving system plus 50 psf of shelving to account for book storage.
  3. Investigate stresses and deflections for shelves fully loaded in combination with seismic forces, and loaded one side in combination with seismic forces.
  4. Anchor shelving to structure, regardless of height.
- D. Use anchorages with specified drilled-in anchors at ICC-ES approved allowable capacities without the on third increase in allowable stress permitted in CBC.
- E. Manufacturer shall be prepared, upon request, to submit calculations for design and anchorage of stacks, prepared by a structural engineer licensed in the State of California.
- F. Overhead bracing and bracing between stacks shall not be permitted.

## **2.02 STEEL MATERIALS**

- A. Steel Sheet: Uncoated, cold-rolled, steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

## **2.03 FIXED, STEEL-BRACKET SHELVES**

- A. Basis-of-Design Product: The design for fixed, steel bracket library shelving is based on Tennsco Corporation's Estey Cantilever Library Shelving
1. Representative: The Ross McDonald Company, (925) 455-1635
- B. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. DEMCO, Inc.
  2. Spacesaver Corporation
  3. Systems & Space
  4. Equal.
- C. Steel-Bracket Shelving: ANSI Z39.73, shelving designed for library use and consisting of two uprights and two spreaders per section forming a four-sided frame, with adjustable shelves on one or both sides of uprights cantilever-hung by brackets.
- D. Shelving Units:
1. Type: Welded, self-supporting units.
  2. Configuration: Single- and double-faced units, as indicated on Drawings
  3. Widths: As indicate on Drawings.
  4. Heights: As indicated on Drawings.
  5. Number and Types of Shelves: As indicated on Drawings
  6. Base Support: Base shelf
  7. Base Shelf Depth: As indicated on Drawings.
  8. Adjustable Shelf Depth: As indicated on Drawings.
  9. End Panels: One at each end of each range. Salvage and re-use existing white end panels , where occurs. Quantity of existing panels to be reviewed. All remaining panels to be new. New panels to match existing.
  10. Canopy Top: Extend full length of each range.
  11. Back Stops: One fixed backstop for each shelf.
- E. Frames:
1. Uprights: Steel channels, 0.060 inch thick minimum, with slots to receive shelf bracket tabs at 1-inch oc.
  2. Spreaders: Tube steel, 0.060 inch thick minimum
  3. Reinforcing Gusset Plates: Triangular steel plates, 0.060 inch thick minimum, with return flange along bottom edge.
- F. Adjustable Shelves: 0.048 inch thick minimum cold-rolled steel sheet. Provide two brackets per shelf; 0.060 inch thick minimum cold-rolled steel.

- G. Base Shelves: One-piece shelves, 0.048-inch-thick minimum cold-rolled steel sheet, designed to receive and fit snugly around uprights, with kick plate 3 inches high. Provide two brackets per base shelf; 0.060-inch-thick minimum cold-rolled steel sheet, with return flange along bottom edge. Provide perforated bases at locations where base shelves cover supply-air grilles.
- H. Levelers: Adjustable pin levelers at carpeted surfaces and adjustable glides elsewhere. Provide number per unit recommended by manufacturer.
- I. End Panels. Laminate end panels with slat, groove aluminum insert treatment. Match existing. Sizes, profiles, configurations, and locations as indicated.
- J. Canopy tops. Laminate canopy top panels. Provide manufacturer's standard attachment brackets for type of top indicated.
- K. Backstops: Manufacturer's standard reversible type.

#### **2.04 MOVABLE, STEEL-BRACKET SHELVING**

- A. Basis-of-Design Product: The design for movable, steel bracket library shelving is based on M.J. Industries' "System 30."
- B. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. Equal
- C. Steel-Bracket Shelving: ANSI Z39.73, shelving designed for library use and consisting of two uprights and two spreaders per section forming a four-sided frame, with adjustable shelves on one or both sides of uprights cantilever-hung by brackets
- D. Shelving Units:
  - 1. Type: Mechanically fastened, starter and adder construction.
  - 2. Configuration: Single and double faced units, as indicated on the Drawings
  - 3. Width: As indicated
  - 4. Heights: As indicated.
  - 5. Number and Types of Shelves: As indicated
  - 6. Base Support: Base shelf with concealed caster units
  - 7. Base Shelf Depth: As indicated
  - 8. Adjustable Shelf Depth: As indicated
  - 9. End Panels: One at each end of each range.

10. Canopy Top: Extend full length of each range.

E. Frames:

1. Uprights: Steel tubes, 0.060 inch thick minimum, with slots to receive shelf bracket tabs at 1 inch o.c.
2. Bases and Spreaders: Tube steel, 0.060 inch thick minimum.
3. Reinforcing Gusset Plates: Triangular steel plates, 0.060 inch thick minimum, with return flange along bottom edge

F. Adjustable Shelves: 0.048-inch-thick minimum cold-rolled steel sheet. Provide two brackets per shelf; 0.060-inch-thick minimum cold-rolled steel.

G. Base Shelves: One-piece shelves, 0.048-inch-thick minimum cold-rolled steel sheet, designed to receive and fit snugly around uprights, with kick plate 3 inches high. Provide two brackets per base shelf; 0.060-inch-thick minimum cold-rolled steel sheet, with return flange along bottom. edge.

H. Concealed Casters: Manufacturer's standard, locking, 2-inch-round units

I. End Panels: Laminate end panels with slat groove, aluminum insert treatment.

J. Canopy Tops: Laminate canopy top panels. Provide manufacturer's standard attachment brackets for type of top indicated.

K. Backstops: Manufacturer's standard reversible type.

## **2.05 DISPLAY BOOKSHELF**

A. Basis of Design Product: The design for single side gondola display is based on Worden 'Single-Sided Gondola Display'

1. Starter Unit: GD-8415-SF-M.
2. Adder Unit: GD-84-15-SF-A-M

B. Finish: Maple

C. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Equal

## **2.06 TIERED MOBILE BOOK DISPLAY**

A. Basis of Design Product: The design for multiple tier book display is based on Worden 'Tiered Mobile Book Display' "TMD-3172-M"

- B. Finish: Maple
- C. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. Equal

## **2.07 GENERAL FINISH REQUIREMENTS**

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Steel Finishes
  - 1. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to achieve a minimum dry film thickness of 2 mils.
    - a. Color and Gloss: As selected by Architect from manufacturer's full product range.

## **2.08 ACCESSORIES**

- A. Floor Anchors: Galvanized steel, post-installed expansion anchors.
- B. Wall Anchors: Manufacturer's standard galvanized-steel anchors.
- C. Top Bracing: Minimum 1- by 1-3/4-inch transverse struts, 0.048-inch-thick minimum steel channels, welded or bolted to top of stack units and securely fastened to structure.
- D. Filler Panels: Provide corner, peninsula, and intermediate wall filler panels; 0.048-inch-thick minimum cold-rolled steel, with fitted caps, in color and finish to match shelving. Locate where indicated to fill gaps at abutting shelving units.
- E. Adjustable Shelf Dividers: One-piece, steel shelf partitions, with hooks or tabs to fit in slots in divider shelves.
  - 1. Provide five per shelf.
- F. Center Backstops: Adjustable steel shelf backstops, 0.048 inch thick minimum, with stiffening flanges and hooks for attachment to uprights.
  - 1. Provide one per shelf
- G. Shelf Label Holders: Clear plastic, 5 inches long, designed to snap over adjustable shelves.
  - 1. Provide one per shelf
- H. Steel Book Supports: 9-inch-high steel, magnetic, and in finish matching shelves.

1. Provide one per shelf
- I. Media Storage Drawers: DVD Media .Locations as indicated on the Drawings, and in finish matching shelves.
  1. Basis of Design: Estey Pullout Browsing Box. Catalog No: XHDBR3611A Includes 5 dividers, 36"w x 12"d x 7"h
- J. Provide changeable range finder signage for all shelves.
- K. Speciality Shelves: Periodical. Locations as indication on the Drawings, and in finish matching shelves.
  1. Basis of Design: Estey Periodical Display Back shelf. Catalog No: PD3610A. Design shelf allows for storage of publications and back issues in upright position. 36"w x 10"d x 12"h

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of library stack systems.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Vacuum finished floor and wet mop resilient flooring over which shelving is to be installed.
  1. Vacuum finished floor and wet mop resilient flooring over which shelving is to be installed.

#### **3.03 INSTALLATION**

- A. Install library stack systems at locations indicated on Drawings and according to manufacturer's written instructions.
- B. Starter/Adder Units: Connect groups together with standard fasteners according to manufacturer's written instructions, using concealed fasteners where possible.
- C. Enclosure Panels: Install end panels and canopy tops with standoffs or concealed fasteners, as indicated on the Drawings.
- D. Level and plumb bookstack units to a tolerance of 1/8 inch in 96 inches.
- E. Filler Panels: Install corner, peninsula, and intermediate wall filler panels where indicated to fill gaps at abutting shelving units.

- F. Install type of shelves at locations indicated and at spacing indicated or, if not indicated, at equal spacing in each unit.

### **3.04 ANCHORAGE**

- A. Bookstack Anchorage: Install bookstacks using floor anchors, wall anchors, or top bracing in locations recommended by manufacturer and as indicated on Drawings.

### **3.05 CLEANING AND PROTECTING**

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Construction Waste Management: Manage construction waste in accordance with provisions of Section 017419 Construction Waste Management and Disposal.
- C. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- D. Protect installed products from damage during remainder of the construction period.
- E. Replace components damaged prior to Substantial Completion.

**END OF SECTION**

## **SECTION 11 81 29 - FACILITY FALL PROTECTION**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Roof anchors.
- B. Horizontal lifeline systems.
- C. Safety railings and gates.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 05 52 13 - Pipe and Tube Railings: Safety railings and gates.

#### **1.03 ABBREVIATIONS AND ACRONYMS**

- A. HLL: Horizontal Lifeline.
- B. IWCA: International Window Cleaning Association.
- C. RDS: Rope Descent System.

#### **1.04 DEFINITIONS**

- A. Anchorage: A secure connecting point or a terminating component of a fall protection system or rescue system capable of safely supporting the impact forces applied by a fall protection system or anchorage subsystem.
- B. Anchorage Connector: A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access, or rescue system for the purpose of coupling the system to the anchorage.
- C. Fall Arrest System: A system designed to stop you in the process of a fall, typically including an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness.
- D. Fall Restraint System: A system designed to keep you from getting close enough to the fall hazard to fall, typically including an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness.
- E. Fall Protection System: System can be either a fall arrest or a fall restraint system.
- F. Lifeline: A component of a fall protection system consisting of a flexible line designed to hang vertically, a vertical lifeline, or connecting to anchorages or anchorage connectors at both ends to span horizontally, a horizontal lifeline.



## 1.05 REFERENCE STANDARDS

- A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- B. 29 CFR 1910.27 - Scaffolds and Rope Descent Systems; Current Edition.
- C. 29 CFR 1910.29 - Fall Protection Systems and Falling Object Protection - Criteria and Practices; Current Edition.
- D. 29 CFR 1910.140 - Personal fall protection systems; Current Edition.
- E. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- F. 29 CFR 1926.502 - Fall protection systems criteria and practices; Current Edition.
- G. ANSI/ASSP A10.32 - Personal Fall Protection Used in Construction and Demolition Operations; 2012.
- H. ANSI/ASSP Z359.7 - Qualification and Verification Testing of Fall Protection Products; 2019.
- I. ANSI/ASSP Z359.12 - Connecting Components for Personal Fall Arrest Systems; 2019.
- J. ANSI/ASSP Z359.15 - Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems; 2014.
- K. ANSI/ASSP Z359.18 - Safety Requirements for Anchorage Connectors for Active Fall Protection Systems; 2017, with Errata (2021).
- L. ANSI/IWCA I-14 - Window Cleaning Safety Standard; 2001.
- M. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2023.
- N. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- O. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- P. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- Q. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- R. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2024.
- S. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

- T. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- U. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- V. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2021.
- W. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- X. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- Y. ASTM A1023/A1023M - Standard Specification for Carbon Steel Wire Ropes for General Purposes; 2021.
- Z. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.
- AA. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube; 2020.
- BB. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tube and Drawn Pipe for General Purpose Applications; 2021.
- CC. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- DD. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.
- EE. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- FF. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- GG. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- HH. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
- II. CAL (OSHA) TITLE 8 SC 7 - California Code of Regulations, Title 8, Subchapter 7, General Industry Safety Orders; 2021.
- JJ. ISO/IEC 17025 - General Requirements for the Competence of Testing and Calibration Laboratories; 2017.

KK. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

LL. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

## 1.06 SUBMITTALS

- A. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.
- B. Product Data: Material, equipment, and fixture lists. Manufacturer's catalog data indicating the sizes, descriptions, capacities, test certifications, and other descriptive data showing in sufficient detail that product complies with contract requirements. Equipment and performance data including but not limited to lifeline anchors, safety tieback anchors, and lifeline cable.
- C. Shop Drawings: Installation details: plan showing locations and types of anchorage points for personal fall protection systems and building maintenance equipment.
  - 1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.
  - 2. Indicate anchorage details and quantity, diameter, and depth of penetration of anchors.
- D. Certificate: Certify that products of this section meet or exceed specified requirements.
- E. Delegated Design Documents: Drawings and calculations sealed by Designer for fall protection system, indicating compliance with performance requirements and design criteria.
- F. Test Report: Indicating completion of proof load testing on installed systems.
- G. Manufacturer's Installation Instructions: Instructions indicating recommended method and sequence of installation for lifeline anchors, safety tieback anchors, energy-absorbing devices, and lifeline cable.
- H. Manufacturer's qualification statement.
- I. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.
- J. Designer's qualification statement.
- K. Installer's qualification statement.
- L. Testing agency's qualification statement.
- M. Operation Data: Provide operating instructions and identify unit limitations.
- N. Maintenance Data: Include parts list and maintenance requirements for equipment.

### **1.07 QUALITY ASSURANCE**

- A. Designer Qualifications: Perform design under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.
- C. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
- D. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

### **1.08 WARRANTY**

- A. See Section 017839 for additional warranty requirements.
- B. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 ROOF ANCHORS**

- A. Manufacturers:
  - 1. Basis of Design: 3M Personal Safety Division: [www.3M.com/FallProtection/#sle](http://www.3M.com/FallProtection/#sle) or approved equal
- B. Application:
  - 1. OSHA and ANSI one person PPE anchor.
  - 2. CAL-OSHA one person PPE anchor.
  - 3. OSHA HLL end anchors.
  - 4. OSHA HLL intermediate anchors.
- C. Description:
  - 1. Roof anchorage points for personal fall protection systems; used exclusively for employee fall protection and independent of any anchorage used to suspend employees or platforms on which employees work.

- a. Anchor Type per ANSI/ASSP Z359.18: Type T.
- D. Structural Performance: Provide safety tieback anchors capable of withstanding design loads as required by governing regulations and codes.
- E. Design Criteria: Fall protection anchors.
  1. Comply with 29 CFR 1910.140 and 29 CFR 1926.502 for personal fall protection systems and anchorage.
  2. Comply with 29 CFR 1926, Subpart M-Fall Protection.
  3. Comply with ANSI/ASSP Z359.18 test requirements for static strength, dynamic strength, residual strength, serviceability, and corrosion of anchorage.
    - a. Testing Labs: Meet requirements of ANSI/ASSP Z359.7 and ISO/IEC 17025.
  4. Comply with CAL (OSHA) TITLE 8 SC 7 requirements for anchors used in personal fall protection systems.
- F. Design Criteria: Primary suspension lines.
  1. Comply with 29 CFR 1910.27 for RDS anchorage requirements.
  2. Comply with 29 CFR 1910.140 for fall protection.
  3. Comply with 29 CFR 1926, Subpart M-Fall Protection.
- G. Provide permanent labels with manufacturer's name, serial number, manufacturing date, and rated load on commercial roof anchors.
- H. Anchors:
  1. Type: Steel anchorage plate with cast steel loop top.
    - a. Loop Diameter: Per manufacturer
    - b. Flat Baseplate:
      - 1) Size: 18 inches square.
      - 2) Thickness: 1 inch.
      - 3) Material: Hot-dip galvanized steel.
      - 4) Bolt Holes: Four 1/2" inch thru-bolt holes.
- I. Anchor Installation:
  1. Type: Field welded.

2. Anchor Substrate: Wood decking. As indicated on drawings
3. Roofing Material: As indicated on drawings.
4. Flashing Material: Membrane flashing, or sealant acceptable to roof manufacturer.

## **2.02 HORIZONTAL LIFELINE SYSTEMS**

- A. Manufacturers:
  1. 3M Personal Safety Division: [www.3M.com/FallProtection/#sle](http://www.3M.com/FallProtection/#sle).
    - a. Basis of Design: 3M DBI Sala; 8mm Permanent Horizontal Lifeline or approved equal
- B. Description: A system comprised of a flexible line such as wire rope or cable, with connectors at both ends to secure it horizontally between two anchorages or anchorage connectors.
- C. Structural Performance: Provide fall-arresting lifeline systems capable of withstanding design loads as required by governing regulations and codes.
- D. Design Criteria:
  1. Comply with ANSI/ASSP Z359.12.
  2. Comply with ANSI/ASSP Z359.15.
  3. Comply with 29 CFR 1926.502.
  4. Comply with ANSI/ASSP A10.32.
- E. Wire Rope: ASTM A1023/A1023M, 7x7 galvanized wire , 5/16 inch diameter.
  1. Stainless Steel Rigging Components: Consisting of turnbuckles, cable clamps, spring energy absorbers, absorber couplers, eye thimbles, bolts, and connector O-rings as required to make a complete and functional HLL system compatible with installed anchors.

## **2.03 SAFETY RAILINGS AND GATES**

- A. Manufacturers:
  1. Garlock Safety Systems: [www.garlocksafety.com/#sle](http://www.garlocksafety.com/#sle).
  2. Guardian Fall Protection: [www.guardianfall.com/#sle](http://www.guardianfall.com/#sle).
  3. Kee Safety, Inc: [www.keesafety.com/#sle](http://www.keesafety.com/#sle).
  4. BlueWater Mfg: [www.bluewater-mfg.com/#sle](http://www.bluewater-mfg.com/#sle).

- B. Steel or Aluminum Safety Railings and Gates: See Section 05 52 13 - Pipe and Tube Railings.
- C. Safety Railings and Gates: Permanent mount safety railings and gates.
- D. Design Criteria:
  - 1. Railing: Comply with 29 CFR 1910.29 and 29 CFR 1926.502 for fall protection.
  - 2. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
  - 3. Distributed Loads: Design railing assembly and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
  - 4. Concentrated Loads: Design railing assembly and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- E. Railing Dimensions: See drawings for configurations and heights.
  - 1. Top Rails: 1-1/4" (1.66" OD-inch diameter, round.
  - 2. Intermediate Rails: 1-1/2-inch diameter, round.
  - 3. Posts: 1-1/4" (1.66" OD-inch diameter, round.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable, provide flush countersunk fasteners.
  - 1. Posts: Provide adjustable flanged brackets.
  - 2. Surface Mounting Bases: Provide zip bases.
- G. Provide slip-on non-welded mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts including, but not limited to, elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- H. Welded Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
  - 1. Ease exposed edges to a small uniform radius.
  - 2. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
  - 3. Aluminum: Perform welding in accordance with AWS D1.2/D1.2M.

- I. Self-Closing Gate: Comply with 29 CFR 1910.29 for safe egress and fall protection.
- J. Posts and Rails: Galvanized steel tubing.
- K. Gate: Same material as railing; automatic closing with latch.
- L. Finish: Manufacturer's standard, factory-applied finish.

#### **2.04 MATERIALS - ALUMINUM**

- A. Aluminum Pipe: Schedule 40; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.
- B. Aluminum Tube: Minimum wall thickness of 0.127 inch; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.
- C. Aluminum Non-Welded Mechanical Fittings: Slip-on cast aluminum, for Schedule 40 pipe, with flush set screws for tightening by standard hex wrench, no bolts or screw fasteners.
- D. Aluminum Welded Fittings: No exposed fasteners; cast aluminum.
- E. Aluminum Straight Splice Connectors: Concealed spigot; cast aluminum.
- F. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

#### **2.05 MATERIALS - STEEL**

- A. Structural Steel Sections: ASTM A36/A36M.
- B. Steel Plates, Shapes, and Bars: ASTM A6/A6M or ASTM A283/A283M.
- C. Steel Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.
- D. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- F. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized in accordance with ASTM A153/A153M where connecting galvanized hardware components.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

#### **2.06 MATERIALS - STAINLESS STEEL**

- A. Stainless Steel, General: ASTM A666, Type 304.



- B. Stainless Steel Tubing: ASTM A554, Type 304, 16 gauge, 0.0625-inch minimum metal thickness, 1-1/2-inch diameter.
- C. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
- D. Welding Materials: AWS D1.6/D1.6M; type required for materials being welded.

## **2.07 FABRICATION**

- A. Fabricate work true to dimension, square, plumb, level, and free from distortion or defects detrimental to appearance and performance.
- B. Grind off surplus welding material and ensure exposed internal corners have smooth lines.
- C. Fabricate system components of the same material unless otherwise indicated.
- D. Fabricate anchoring devices as recommended by the manufacturer to provide adequate support for intended use.
- E. Fabricate joints in a manner to discourage water accumulation. Provide weep holes to drain all water that could accumulate in the exposed joints.

## **2.08 FINISHES**

- A. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
  - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine area for compliance with requirements for installation tolerances and other conditions related to this work.
- B. Confirm that the ladder structure to which the ladder safety system is installed can withstand the loads applied by the system in the event of a fall.
- C. Proceed with installation after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Coordinate location of fall protection equipment indicated to be attached to structural substrate or surface of roofing system and provide anchoring devices with templates, diagrams, and installation instructions.

### **3.03 INSTALLATION**

- A. Install anchorage and fasteners in accordance with shop drawings and manufacturer's recommendations to obtain allowable working loads published in product literature and in accordance with this specification.
- B. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous coating or by other permanent separation as recommended by fall protection system manufacturer.
- C. Deform threads of tail end of anchor studs after nuts have been tightened to prevent accidental removal or vandalism.
- D. Do not load or stress anchors until all materials and fasteners are properly installed and ready for service.
- E. Seal roof penetrations at anchors with pre-molded pipe flashing, membrane flashing, or sealant acceptable to roof manufacturer.
- F. Install all roof safety anchors a minimum of 6 feet from the roof edge.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 for additional requirements.
- B. Test anchorage systems using only chemical adhesive fasteners on-site using load cell test apparatus in accordance with manufacturer's recommendations.
- C. Inspect each anchor for conformance to manufacturer requirements, building envelope, looseness, and signs of permanent deflection during load testing.

### **3.05 ADJUSTING**

- A. Adjust fall protection components to function smoothly and safely.

### **3.06 CLEANING**

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing in accordance with ASTM A780/A780M.
- B. Clean exposed surfaces in accordance with fall protection system manufacturer's written instructions.

### **3.07 CLOSEOUT ACTIVITI**

- A. See Section 017700 and 017839 for additional requirements..
- B. Demonstrate proper operation of roof safety anchors to Owner's designated representative.
- C. Demonstration: Demonstrate operation of system to Owner's personnel.

1. Use operation and maintenance data as reference during demonstration.
  2. Briefly describe function, operation, and maintenance of each component.
- D. Training: Train Owner's personnel on operation and maintenance of system.
1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  2. Provide minimum of two hours of training.
  3. Instructor: Manufacturer's training personnel.
  4. Location: At project site.

### **3.08 MAINTENANCE**

- A. See Section 017700 for additional requirements relating to maintenance service.
- B. 29 CFR 1910 and ANSI/IWCA I-14 require that anchors first be certified and subsequently inspected on an annual basis. Coordinate with manufacturer and local inspectors as required to maintain compliance.
- C. Provide a separate maintenance contract for specified maintenance service.

**END OF SECTION**

## **SECTION 12 48 13 - ENTRANCE FLOOR MATS AND FRAMES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Stainless steel recessed entrance floor grilles and frames

#### **1.02 SUBMITTALS**

- A. Product Data: Provide data indicating properties of walk-off surface, component dimensions, recessed frame characteristics, and finishes for floor grilles.
- B. Shop Drawings: Indicate dimensions and details for recessed frame.
  - 1. For recessed frames located within a dimensionally restricted area, show dimensions of space within which the frame will be installed.
- C. Samples: Submit two samples, 6 by 12 inch in size illustrating pattern, color, finish, and edging. Or manufacturer's standard sizes
- D. Maintenance Data: Include cleaning instructions and stain removal procedures.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Entrance Floor Grilles and Gratings:
  - 1. Hendrick Architectural Products, Entrance Grille:  
[www.https://www.hendrickcorp.com/architectural/](https://www.hendrickcorp.com/architectural/)
  - 2. Babcock-Davis; \_\_\_\_\_: [www.babcockdavis.com/#sle](http://www.babcockdavis.com/#sle).
  - 3. Construction Specialties, Inc; Entrance Grids: [www.c-sgroup.com/#sle](http://www.c-sgroup.com/#sle).
  - 4. Equal.

#### **2.02 ENTRANCE FLOOR GRILLES , GENERAL**

- A. Entrance Floor Grille: Provide manufacturer's standard floor-grille assemblies consisting of treads of type and profile indicated, interlocked by cross members, and with support legs (if any) and other components to produce a complete installation.
  - 1. Basis of Design Product: 'Hendrick Architectural Products' entrance grating with "profile bar" construction.
  - 2. Surface Treads: Hendrick Architectural Products "B-12" 0.187 inch wide, by 0.500 inches inches, high bar with openings between bars; 50 percent open area.

3. Supports: Manufacturer's standard spacing, non-welded and interlocked
  4. Stainless steel finish: No. 4 - directional satin finish.
  5. Grating Depth: As indicated,
  6. Recess Depth Below Bottom of Grating: As indicated
  7. Length in Direction of Traffic Flow: 48" inches.
  8. Width Perpendicular to Traffic Flow: Full width of entrance door opening.
  9. Frame: Provide manufacturer's standard frames of size and style for grille type, for permanent recessed installation, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.
  10. Pan: Provide manufacturer's standard, 0.060 inch thick, stainless steel sheet drain pan. Coat bottom of pan with protective coating recommended by manufacturer.
- B. Mounting: Top of treads level with adjacent floor.
- C. Structural Capacity: Capable of supporting a wheel load of 350 pounds per wheel without permanent deformation or noticeable deflection.. Capable of uniform floor load of 300 pounds per sq ft.
- D. Regulatory Requirement: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board ADA-ABA Accessibility Guidelines for Buildings and Facilities, ICC A117.1 and the California Building Code.
- E. Vibration Resistant Fabrication: All members welded, riveted, or bolted; no snap or friction connections.
- F. Lockdown: Manufacturer's Standard
- G. Materials: Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304
- H. Materials: Stainless Steel Angles: ASTM A 276 or ASTM A479A 479M, corrosion resistant, Type 304

### **2.03 FABRICATION**

- A. Shop fabricate floor grilles to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each grille as single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from nominal traffic lanes.
- B. Fabricate grille with consistent, accurate openings between surface tread bars.

- C. Fabricate frame members in single lengths or where frame dimensions exceed maximum lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates and floor conditions for compliance with requirements for location, size, minimum recess depth, and other floor conditions affecting installation of floor grille and frame
- B. Verify that floor opening for mats are ready to receive work. Coordinate depressed depth required by grille at the concrete fill area
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Vacuum clean floor recess.

#### **3.03 INSTALLATION**

- A. Install walk-off surface in floor recess flush with finish floor after cleaning of finish flooring.
- B. Install recessed floor grilles, frames and drain pans to comply with manufacturer's written instruction at locations indicated and with top of floor grilles and frames in relationship to one another and to adjoining finished flooring as recommended by manufacturer. Set floor-grille tops at height for most effective cleaning action. Coordinate top of floor-grille surfaces with doors that swing across grilles to provide clearance under door.

#### **3.04 PROTECTION**

- A. After completing frame installation, provide temporary filler of plywood or fiberboard in floor grille recess and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion

**END OF SECTION**

## **SECTION 21 00 00 – FIRE SUPPRESSION BASIC REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Work included in 21 00 00, Fire Suppression Basic Requirements applies to Division 21, Fire Suppression work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of fire protection systems for proposed project.
- B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.
- C. Definitions:
  - 1. Provide: To furnish and install, complete and ready for intended use.
  - 2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
  - 3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete Item of work furnished.
  - 4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent," substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted Item.
  - 5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

#### **1.02 RELATED SECTIONS**

- A. Content of Section applies to Division 21, Fire Suppression Contract Documents.
- B. Related Work:
  - 1. Additional conditions apply to this Division including, but not limited to:
    - a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
    - b. Drawings
    - c. Addenda

- d. Owner/Architect Agreement
- e. Owner/Contractor Agreement
- f. Codes, Standards, Public Ordinances and Permits

### **1.03 REFERENCES AND STANDARDS**

- A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 21, Fire Suppression Sections and those listed in this Section.
- B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
  - 1. State of California:
    - a. CBC - California Building Code
    - b. CEC - California Electrical Code
    - c. CEC T24 - California Energy Code Title 24
    - d. CFC - California Fire Code
    - e. CMC - California Mechanical Code
    - f. CPC - California Plumbing Code
    - g. CSFM - California State Fire Marshal
- C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
  - 1. ABA - Architectural Barriers Act
  - 2. ADA - Americans with Disabilities Act
  - 3. AHRI - Air-Conditioning Heating & Refrigeration Institute
  - 4. ANSI - American National Standards Institute
  - 5. ASCE - American Society of Civil Engineers
  - 6. ASCE-7 Minimum Design Loads for Buildings and Other Structures
  - 7. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
  - 8. ASHRAE Guideline 0, the Commissioning Process
  - 9. ASME - American Society of Mechanical Engineers
  - 10. ASPE - American Society of Plumbing Engineers



11. ASSE - American Society of Sanitary Engineering
12. ASTM - ASTM International
13. AWWA - American Water Works Association
14. CFR - Code of Federal Regulations
15. EPA - Environmental Protection Agency
16. ETL - Electrical Testing Laboratories
17. FCC - Federal Communications Commission
18. FM - FM Global
19. FM Global - FM Global Approval Guide
20. IAPMO - International Association of Plumbing and Mechanical Official
21. ICC - International Code Council
22. IEC - International Electrotechnical Commission
23. ICC-ESR - International Code Council Evaluation Service Reports
24. HI - Hydraulic Institute Standards
25. ISO - International Organization for Standardization
26. MSS - Manufacturers Standardization Society
27. NEC - National Electric Code
28. NEMA - National Electrical Manufacturers Association
29. NFPA - National Fire Protection Association:
  - a. NFPA 13 - Standard for the Installation of Sprinkler Systems
  - b. NFPA 24 - Standard for Installation of Private Fire Service Mains and Their Appurtenances
  - c. NFPA 25 - Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
  - d. NFPA 70 - National Electrical Code
  - e. NFPA 72 - National Fire Alarm and Signaling Code
30. NRCA - National Roofing Contractors Association
31. NSF - National Sanitation Foundation

32. OSHA - Occupational Safety and Health Administration
33. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
34. TIMA - Thermal Insulation Manufacturers Association
35. UL - Underwriters Laboratories Inc.

D. See Division 21, Fire Suppression individual Sections for additional references.

#### **1.04 SUBMITTALS**

- A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 21, Fire Suppression sections.
- B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.
- C. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
- D. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. Copy Architect on all transmissions/submissions.
- E. Submit shop drawings, calculations and product data sheets as one complete stand-alone package to AHJ, Owner's insurance underwriter and Engineer.
- F. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 21, Fire Suppression Sections.
- G. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
  1. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed Item. Highlight connections by/to other trades.

2. Include technical data, installation instructions and dimensioned drawings for products, equipment and devices installed, furnished or provided. Reference Division 21, Fire Suppression specification Sections for specific Item required in product data submittal outside of these requirements.
  3. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
  4. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
  5. See Division 21, Fire Suppression Sections for additional submittal requirements outside of these requirements.
- H. Maximum of two reviews provided of complete submittal package. Arrange for additional reviews and/or early review of long-lead Item; Bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
- I. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer's comments. Identify Engineer's comments and provide an individual response to each of the Engineer's comments. Cloud changes in the submittals and further identify changes which are in response to Engineer's comments.
- J. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
- K. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 21, Fire Suppression coordination documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical and Division 28, Electronic Safety and Security submittals.
- L. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
- M. Substitutions and Variation from Basis of Design:
1. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.

2. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

N. Shop Drawings:

1. Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout, pipe layout, hanger layout, sway brace layout, seismic restraints, sway brace calculations, drains, location of drain discharge, risers, valves, details, water test information, physical device layout plans, and control wiring diagrams. Reference individual Division 21, Fire Suppression Sections for additional requirements for shop drawings outside of these requirements.
2. Shop Drawings and hydraulics calculations, sway brace calculations, trapeze hanger calculations, and the like, to be prepared under the direct supervision and control of a Professional Engineer competent to do such work and licensed in the state of California. Drawings and calculations to bear the seal and wet signature of the professional Engineer.
3. Provide Shop Drawings which indicate information required by NFPA 13. Include room names and fire sprinkler occupancy hazard classifications.
4. Provide Shop Drawings illustrating information for Hydraulic Information Sign for each hydraulic remote area calculated.
5. Utilizing the Reflected Ceiling backgrounds, provide Shop Drawings illustrating locations of fire sprinklers and piping.
6. Utilizing the Structural backgrounds, provide Shop Drawings illustrating locations and types of hangers and sway braces.
7. Provide Shop Drawings illustrating each type of hanger, including fasteners to structure.
8. Provide Shop Drawings illustrating each type of branchline restraint and sway brace, including length of sway brace member, sway brace fittings, minimum and maximum angles from vertical of sway brace member, method of attachment to structure, size, length and embedment of attachment to structure and size and type of structural member to which sway brace will be attached. Number each type of restraint and sway brace. Indicate on Drawings locations of each type of numbered restraint and sway brace.

9. Provide details for any hanger, attachment, or sway brace to be attached to any I-joist, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the engineered product manufacturer.
  10. Provide Shop Drawings illustrating information for Sprinkler System General Information Sign.
  11. Shop Drawings to include a cross-sectional view that shows the sprinkler heads and piping in relation to the building's architectural and structural information. View to be chosen based on a location that will display the most information.
  12. When required, provide Coordination Drawings.
  13. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
  14. Provide details of hanger, sway bracing and branch line restraint attachments to structure and to piping. Include details on the size and load capacities of fasteners. Provide verification of the structural capacity to withstand seismic load.
  15. Provide sway bracing calculations on drawings showing horizontal seismic design load and requirements, with indication of zone of influence for each bracing location.
  16. Provide a schedule of sway bracing type, size, and design criteria, including length, angle from vertical, and load capacities.
  17. Clearly indicate the elevation of the highest sprinkler in relation to the elevation of the flow test pressure gauge monitor hydrant.
  18. On the drawings, provide a list of number, model, temperature, sprinkler Identification number, manufacturer, orifice, deflector type, thermal sensitivity and pressure rating, quantity of each type to be contained in the spare sprinkler cabinet and the issue date or revision date of the list."
  19. Spare sprinkler head cabinet size indicating the number of spare sprinkler head to be contained therein.
- O. Samples: Provide samples when requested by individual Sections.
- P. Resubmission Requirements:
1. Make any corrections or change in submittals when required. Provide submittals as specified. The Engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Clearly indicate changes on Drawings and cloud changes in the submittals.
  2. Resubmit for review until review indicates no exceptions taken or make "corrections as noted".

Q. Operation and Maintenance Manuals/Owner's Instructions:

1. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or Item requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
  - a. Include copies of certificates of code authority acceptance, code-required acceptance tests; test reports and certificates.
  - b. Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Sections.
  - c. Catalog description of each Item of equipment actually installed on job.
  - d. Instructions for operation and maintenance of fire suppression systems composed of operating instructions, maintenance instructions and manufacturer's literature as follows:
    - 1) Testing and Maintenance Schedule Chart: Provide an 8-1/2- by 11-inch typewritten list of each item of installed equipment requiring testing inspection , lubrication or service, describing and scheduling performance of maintenance.
    - 2) Manufacturer's Literature: Provide copies of manufacturer's instructions for operation and maintenance of fire suppression equipment, including replacement parts list with name and address of nearest distributor. Mark each copy with equipment identification label as listed in equipment schedule, i.e. F-5 etc.
  - e. Include product certificates of warranties and guarantees.
  - f. Include Record Drawings,
  - g. Include copy of water supply flow test used as basis for hydraulic calculations.
  - h. Include hydraulic calculations and sway brace calculations.
  - i. Include Contractor's Material and Test Certificates for Aboveground Piping/Underground Piping.
  - j. Include a copy of NFPA 25.
  - k. Include a copy of valve charts and whether normally open or normally closed.
  - l. Include a copy of drain, auxiliary, and low point drains charts.
  - m. Include a copy of the list to be included in the spare sprinkler head box.

- n. Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
  - o. Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, and quantities relevant to each piece of equipment i.e. belts, motors, lubricants, and filters.
  - p. Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub-assemblies.
  - q. Include copy of startup and test reports specific to each piece of equipment.
  - r. Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.
2. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 21 00 00, Fire Suppression Basic Requirements, Article titled "Demonstration".
3. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.
- R. Record Drawings:
- 1. Maintain at site at least one set of Drawings for recording "As-constructed" conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical Item. Include items changed by field orders, supplemental instructions, and constructed conditions.
  - 2. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
  - 3. At completion of project, input changes to original project on CAD Drawings and make one set of black-line drawings created from CAD Files in version/release equal to contract drawings. Submit CAD disk and drawings upon substantial completion.
  - 4. Invert elevations and dimensioned locations for water services and drainage piping below grade extending to 5-feet outside building line.

5. Record Drawings to include site information or reference site information for complete understanding of the fire protection system between the building and the point of connection to the water supply and location of flow test pressure hydrants.
  6. See Division 21, Fire Suppression individual Sections for additional items to include in Record Drawings.
- S. Calculations: Submit hydraulic, sway brace, and the like calculations.
1. Hydraulic Calculations:
    - a. Include friction losses between the hydraulically most remote design area and the hydrant flow test pressure hydrant.
    - b. Hydraulic calculations to be performed on a nationally recognized fire sprinkler hydraulic calculation computer program, with cover sheets in the format required by the latest edition of NFPA 13. Hydraulic calculations performed "by hand" or not on a nationally recognized fire sprinkler hydraulic calculations computer program will be returned without review by engineer.
    - c. Provide one or more hydraulic calculations for each hydraulically most remote area.
    - d. Where it is not obvious which area is most hydraulically remote, perform and submit for review additional hydraulic calculations proving the hydraulically most remote area.
    - e. For grid systems, either provide "peaked" hydraulic calculations, or provide two additional sets of hydraulic calculations for each hydraulically most remote area.
    - f. Include pressure losses between the highest sprinkler and the elevation of the pressure gauge monitor hydrant of the flow test.
  2. Sway Brace Calculations:
    - a. Sway brace calculations utilizing a proprietary computer calculation program only used for the sway brace components supported by that manufacturer. For example, only "manufacturer X" sway brace components, and not those of another manufacturer, may be calculated on a "manufacturer X" sway brace computer calculation program.
    - b. Provide seismic calculations for any sway brace to be attached to any I-joint, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the I-joint manufacturer.



### **1.05 QUALITY ASSURANCE**

- A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.
- B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.
- C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every Item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.
- D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.
- E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.
- F. Provide products that are UL listed.
- G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

### **1.06 WARRANTY**

- A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

## 1.07 COORDINATION DOCUMENTS

- A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings), to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, fire alarm, plumbing, cable trays, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, electrical, fire alarm ceiling suspension and tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling and finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence. Unless otherwise required by Division 00, Procurement and Contracting Requirements and/or Division 01, General Requirements, Division 23, HVAC to combine information furnished by other trades onto master coordination documents.
- B. Prepare Drawings as follows:
1. Provide drawings in CAD Format. CAD format release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
  2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
  3. Indicate fire protection system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
  4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible Item. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings, architectural reflected ceiling drawings and HVAC equipment, ductwork and piping. Drawings to indicate proposed and identified structural members to which hangers and sway braces will be attached as shown on structural drawings.
  5. Incorporate Addenda Item and change orders.
  6. Provide additional coordination as requested by other trades.
- C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.
- D. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.
- E. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to sprinkler heads, pipe, fittings, hangers and bracing materials.

### **2.02 STANDARDS OF MATERIALS AND WORKMANSHIP**

- A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL, ETL, FM, ICC-ES, CSFM, and CSA approved for their intended fire protection function or have adequate approval or be acceptable by State, County, and City authorities.
- B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.
- C. Hazardous Materials:
  - 1. Comply with local, State of California, and Federal regulations relating to hazardous materials.
  - 2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
  - 3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

## **PART 3 - EXECUTION**

### **3.01 ACCESSIBILITY AND INSTALLATION**

- A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Install equipment requiring access (i.e. drains, control operators, valves, motors, engines, pumps, controllers, air compressors, gauges, fill cups, tanks, cleanouts and the like) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede, or block intended usage.
- C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

- D. Firestopping:
1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection.
  2. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM International E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- E. Pipe Installation:
1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating coordinating installation of piping systems.
  2. Include provisions for servicing and removal of equipment without dismantling piping.
- F. Plenums: Provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

### **3.02 SEISMIC CONTROL**

- A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 21, Fire Suppression Sections.
- B. Provide fire suppression equipment and piping, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces equal to lateral seismic forces as determined by building code and NFPA 13 calculations, whichever is more demanding.
- C. See Structural Drawings for seismic design criteria for sway bracing and seismic restraint.
- D. Earthquake resistant designs for Fire Protection (Division 21) equipment and distribution, i.e. fire sprinkler systems, fire standpipe systems, fire pumps, fire pump controllers, fire tanks, clean agent fire suppression systems, etc. to conform to regulations of jurisdiction having authority.
- E. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.

- F. Piping: Per NFPA 13, ASCE-7 and local requirements.
- G. Equipment:
  - 1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA, ASCE 7 and local requirements.
  - 2. Provide means to prohibit excessive motion of fire protection equipment during an earthquake.

### **3.03 REVIEW AND OBSERVATION**

- A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
  - 1. Underground piping installation prior to backfilling.
  - 2. Prior to covering walls.
  - 3. Prior to ceiling cover/installation.
  - 4. When main systems, or portions of, are being tested and ready for inspection by AHJ.
  - 5. When mains or branchlines are to be permanently concealed by construction or insulation systems.
  - 6. When fire suppression systems, or portions of, are being tested and ready for inspection by AHJ.
- C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.
- D. Final Punch: Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

### **3.04 CONTINUITY OF SERVICE**

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
  - 1. During remodeling or addition to existing structures, while existing structure is occupied, current services to remain intact until new construction, facilities or equipment is installed.

2. Prior to changing over to new service, verify that every Item is thoroughly prepared. Install new piping, and wiring to point of connection.
3. Coordinate transfer time to new service with Owner. If required, perform transfer during off peak hours. Once changeover is started, pursue to its completion to keep interference at a minimum. If overtime is required, there will be no allowance made by Owner for extra expense for such overtime or shift work.
4. During entire time system, or part thereof, is not operational, provide a firewatch per Fire Code, including a watchperson whose sole duty is to watch for and report fires.
5. Organize work to minimize duration of power interruption.

### **3.05 CUTTING AND PATCHING**

- A. Confirm Cutting and Patching requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
  1. Cutting and patching performed under Division 21, Fire Suppression includes, but is not limited to:
    - a. Cutting and patching of plaster or partitions.
    - b. Cutting and patching of finished ceilings.
  2. Perform cutting and patching by skilled craftsmen in trade of work to be performed. Fill holes which are cut oversized for completed work. Match refinished areas with existing adjacent finish in a manner acceptable to Architect.
  3. When masonry to concrete construction must be penetrated, provide a steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish. Provide escutcheons. If sleeves are not provided, core drill penetrations.
  4. Locate concealed utilities to eliminate possible service interruption or damage.
  5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.
  6. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
  7. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.

8. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
9. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, landscaping, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
10. Repair mutilation of building around pipes, equipment, hangers, and braces.

### **3.06 EQUIPMENT SELECTION AND SERVICEABILITY**

- A. Replace or reposition equipment which is too large or located incorrectly to permit servicing at no additional cost to Owner.

### **3.07 DELIVERY, STORAGE AND HANDLING**

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
  1. Handle materials delivered to project site with care to avoid damage and deterioration. Store materials in original containers which identify manufacturer, name, brand and model numbers on site inside building or protected from weather, sun, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.
  2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
  3. Protect bright finished shafts, bearing housings and similar Item until in service.

### **3.08 DEMONSTRATION**

- A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

- C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.
- D. Prior to acceptance of work and during time designated by Architect, provide necessary qualified personnel to operate system for a period of four hours.
- E. Instruct the Owner in the operation of the sprinkler system, including main valve position (open or closed) recognition, system drainage, system testing, dry pipe valve reset and the relation to the fire alarm system.
- F. Upon completion of work and adjustment of equipment, test systems to demonstrate to Owner's Authorized Representative and Architect that equipment is furnished and installed or connected under provisions of these Specifications.

### **3.09 CLEANING**

- A. Confirm Cleaning requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Upon completion of installation, except for sprinklers, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.
- C. Sprinklers may not be cleaned except for vacuuming in a manner in which no part of the sprinkler is touched by the vacuuming equipment. Replace sprinklers which bear traces of foreign substances with sprinklers of same model, temperature, K-factor, orifice, finish, style, orientation, and the like.

### **3.10 INSTALLATION**

- A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Install equipment in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.
- C. Start-up equipment, in accordance with manufacturer's start-up instructions, in the presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment. Provide pump impellers to obtain Basis of Design design capacities.
- D. Provide miscellaneous supports/metals required for installation of equipment and piping.



### 3.11 PAINTING

- A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
1. Piping, Hangers, Bracing, and Branch Line Restraints: Clean, primer coat and paint piping exposed to view in public areas, entry, and staff rooms with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.

### 3.12 DEMOLITION

- A. Confirm Demolition requirements in Division 01, General Requirements and Division 02, Existing Conditions. In absence of specific requirements, comply with individual Sections in Division 21, Fire Suppression and the following:
1. Scope:
    - a. It is the intent of these documents to provide necessary information and adjustments to fire protection system required to meet code and accommodate installation of new work.
    - b. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access or access to different areas.
    - c. Existing Conditions: Determine exact location of existing utilities and equipment before commencing work, compensate Owner for damages caused by failure to exactly locate and preserve underground utilities. Replace damaged Item with new material to match existing. Promptly notify Owner if utilities are found which are not shown on Drawings.
  2. Equipment and Piping: Unless otherwise directed, equipment, piping, or fittings being removed as part of demolition process are Owner's property. Remove other Item not scheduled to be reused or relocated from job site as directed by Owner.
  3. Unless specifically indicated on Drawings, remove exposed, unused piping to behind finished surfaces (floor, walls, ceilings, etc.). Cap piping and patch surfaces to match surrounding finish.
  4. Unless specifically indicated on Drawings, remove unused equipment, fittings, rough-ins, and connectors. Removal is to be to a point behind finished surfaces (floors, walls, and ceilings).
  5. Coordinate demolition of existing fire suppression systems with Contractor. Where applicable or possible, portions of fire suppression demolition work may be performed by Contractor. Verify with local AHJ as to limitations of demolition by others and not fire suppression trades. Coordinate extent of demolition of fire suppression work to be done by others and supervise this work. No extra costs will be approved by replacement of systems due to improper or excessive demolition.

### 3.13 ACCEPTANCE

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Sections in Division 21, Fire Suppression and the following:
  - 1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
    - a. Testing reports including Contractor's Material and Test Certificate for Underground Piping, Contractor's Material and Test Certificate for Aboveground Piping, Contractor's Material and Test Certificate for Private Fire Service Mains, Fire pump acceptance test data report, and the like.
    - b. Cleaning
    - c. Operation and Maintenance Manuals
    - d. Training of Operating Personnel
    - e. Record Drawings
    - f. Warranty and Guaranty Certificates
    - g. Start-up/Test Document and Commissioning Reports
    - h. Letter of Conformance

### 3.14 FIELD QUALITY CONTROL

- A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.
- B. Upon completion of installation of equipment, sprinklers, hose valves and piping and after units are water pressurized, test system to demonstrate capability and compliance with requirements. When possible, correct malfunctioning Item at site, then retest to demonstrate compliance; otherwise remove and replace with new Item and proceed with retesting.
- C. Inspect each installed Item for damage to finish. If feasible, restore and match finish to original, except fire sprinklers, at site; otherwise, remove Item and replace with new Item. Feasibility and match to be judged by Architect. Remove cracked or dented Item and replace with new Item.
- D. Fire sprinklers may not be reused, or cleaned, except for dusting. Replace damaged, field painted, oversprayed, overcoated or field coated sprinklers with new sprinklers of same manufacturer, model, finish, K-factor and performance characteristics. Where identical replacement sprinklers are not available, provide sprinklers of similar finish, style, K-factor and performance characteristics.

**3.15 LETTER OF CONFORMANCE**

- A. Provide Letter of Conformance and copies of manufacturers' warranties and extended warranties with a statement that fire suppression items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

**3.16 CONNECTIONS TO EXISTING**

- A. Prior to connection of piping to existing piping or utilities, field verify existing conditions and exact sizes and locations of existing piping. Provide additional offsets, transitions, joints, cut-ins, and replace portions of existing as required to facilitate connections of new.

**END OF SECTION**

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**SECTION 21 05 00 – COMMON WORK RESULTS FOR FIRE SUPPRESSION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Work Included:
  - 1. Aboveground Black Steel Pipe and Fittings
  - 2. Wall and Floor Penetrations and Sleeves
  - 3. Hangers and Supports
  - 4. Struts and Strut Clamps
  - 5. Sway Braces and Restraints
  - 6. Anchors and Attachments
  - 7. Pipe Stands
  - 8. Valves
  - 9. Pipe, Valve, and Fire Protection Equipment Identification
  - 10. Signs
  - 11. Drains

**1.02 RELATED SECTIONS**

- A. Contents of Division 21, Fire Suppression and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
  - 1. Division 22, Plumbing
  - 2. Division 23, Heating, Ventilating and Air Conditioning
  - 3. Division 26, Electrical
  - 4. Division 28, Electronic Safety and Security
  - 5. Division 31, Earthwork
  - 6. Section 21 00 00, Fire Suppression Basic Requirements
  - 7. Section 21 13 00, Fire Suppression Sprinkler Systems

### 1.03 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.
- B. Meet requirements of ASCE 7, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers, latest adopted edition.

### 1.04 SUBMITTALS

- A. Submittals as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

### 1.05 QUALITY ASSURANCE

- A. Quality assurance as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Material and Equipment: Listed for its intended fire protection use in current UL Fire Protection Equipment Directory, or UL Online Certifications Directory for Fire Protection, International Code Council Evaluation Service Reports, or FM Global Approval Guide. All material and equipment to be new and from a current manufacturer.
  - 2. Provide per AHJ requirements.
  - 3. References to product Specifications for materials are listed according to accepted ANSI, ASTM, ASME, AWWA and other base standards. Materials to meet latest approved versions of these standards.
  - 4. Fire Suppression Screw-Thread Connections: Comply with local fire department/fire marshal regulations for sizes, threading and arrangement of connections for fire department equipment to fire department connections.
  - 5. Manufacturers: Unless an item is marked "No substitutions", submit substitution request for materials of other than named manufacturers.
  - 6. Noise and Vibration:
    - a. Install vibration isolators and measures required to prevent noise and vibration from being transmitted to occupied areas. Select equipment to operate within noise coefficient (NC) design level for particular type of installation in relation to its location.
    - b. After installation, make proper adjustments to reduce noise and vibration to acceptable levels as defined by Architect.
    - c. In acoustically sensitive areas, design system in a manner that minimizes the number of wall penetrations.

## **1.06 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

## **1.07 FLOW TEST**

- A. If flow test information provided below has been conducted less than 12 months prior to working plan submittal, utilize for design of NFPA 13 fire sprinkler and NFPA 14 standpipe systems.
- B. If flow test information provided below has been conducted greater than 12 months prior to working plan submittal, the information provided is advisory only and not to be used for design. Provide materials and labor for a new water supply test on the closest nearby fire hydrants per NFPA 13 and NFPA 291. Utilize new flow test results for design of NFPA 13 fire sprinkler and NFPA 14 standpipe systems.
- C. Flow Test:
  - 1. Flow: 1244 GPM at a residual pressure of 62 PSI.
  - 2. Static Pressure: 65 PSI.
  - 3. Location: 821 East Washington.
  - 4. Date: 11/02/2020.
  - 5. Information Provided By: City of Petaluma.

## **1.08 SYSTEM IMPAIRMENT**

- A. When returning a water-based fire protection system to service after impairment or control valve closure, verify the system is in working order by performing a main drain test per NFPA 25.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Aboveground Black Steel Pipe and Fittings:
  - 1. Pipe:
    - a. Bull Moose Tube
    - b. Wheatland Tube Co.
    - c. Youngstown Tube Co.
    - d. Tex-Tube Co.
    - e. State Pipe and Supply, Inc.

- f. Or approved equivalent
- 2. Fittings, Mechanical and Grooved Couplings:
  - a. Victaulic
  - b. Gruvlok
  - c. Shurjoint Piping Products Inc.
  - d. Smith-Cooper International
  - e. Tyco Fire & Building Products
  - f. Viking Corp.
  - g. Allied Rubber and Gasket Co. Inc., dba ARGCO
  - h. Anvil International
  - i. Dixon Valve & Coupling
  - j. Or approved equivalent.
- 3. Fittings, Threaded:
  - a. Ward Mfg.
  - b. Anvil International
  - c. Smith-Cooper International
  - d. Aegis Technologies
  - e. Or approved equivalent.
- 4. Fittings, Rubber Gasketed:
  - a. Victaulic
  - b. Anvil International
  - c. AnvilStar
  - d. EBAA Iron, Inc.
  - e. Shurjoint Piping Products, Inc.
  - f. Smith-Cooper International
  - g. Tyco Fire & Building Products
  - h. Viking Corp.



- i. Ward Mfg.
  - j. Allied Rubber and Gasket Co. Inc., dba ARGCO
  - k. Dixon Valve & Coupling
  - l. Or approved equivalent.
- 5. Fittings, Welded:
  - a. Anvil International
  - b. Shurjoint Piping Products Inc.
  - c. Smith-Cooper International
  - d. State Pipe & Supply, Inc.
  - e. Or approved equivalent.
- B. Wall and Floor Penetrations and Sleeves:
  - 1. Allied Rubber and Gasket Co., Inc., dba ARGCO
  - 2. Fire Protection Products Inc. (FPPI)
  - 3. Or approved equivalent.
- C. Hangers and Supports:
  - 1. Cooper B-Line Tolco
  - 2. Anvil International
  - 3. ITW Buildex Sammys
  - 4. Erico International
  - 5. PHD Mfg. Inc.
  - 6. Or approved equivalent.
- D. Struts and Strut Clamps:
  - 1. Cooper B-Line Tolco
  - 2. Or approved equivalent.
- E. Sway Braces and Restraints:
  - 1. Cooper B-Line Tolco
  - 2. Anvil International

3. Erico International
4. PHD Mfg. Inc.
5. Or approved equivalent.

F. Anchors and Attachments:

1. Wood:
  - a. Cooper B-Line Tolco
  - b. Anvil International
  - c. Elco Construction Products
  - d. Erico International
  - e. ITW Buildex Sammys
  - f. Or approved equivalent.

G. Valves:

1. Automatic Air Release Valve:
  - a. Potter Electric Signal Co.
  - b. Or approved equivalent.
2. Ball Valve:
  - a. Victaulic
  - b. Apollo Valves
  - c. Fire Protection Products Inc. (FPPI)
  - d. Nibco
  - e. Or approved equivalent.

H. Pipe, Valve, and Fire Protection Equipment Identification:

1. Fire Protection Products, Inc. (FPPI)
2. Allied Rubber and Gasket Co., Inc., dba ARGCO
3. Or approved equivalent.

I. Signs:

1. Tyco Fire Products

2. Reliable Automatic Sprinkler
3. Viking Corp.
4. Allied Rubber and Gasket Co., Inc., dba ARGCO
5. Or approved equivalent.

J. Drains:

1. Reference Aboveground Black Steel Pipe and Fittings.
2. AGF
3. Victaulic
4. Or approved equivalent.

**2.02 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS**

A. Wet Pipe Systems:

1. Pipe Size 2-inch Diameter and Smaller: ASTM A53, ASTM A135, or ASTM A795; minimum of Schedule 40.
2. Pipe Size 2-1/2-inch Diameter and Larger: ASTM A53, ASTM A135, or ASTM A795; minimum of Schedule 10.
3. Exposed pipe 8-feet or less above finished floor: A minimum of Schedule 40.

B. Joints:

1. Threaded, flanged or bevel welded.
2. Piping installed in plenums or shafts to have welded joints.

C. Fittings:

1. Threaded:
  - a. Malleable Iron: Class 150 and Class 300, ANSI B16.3.
  - b. Cast Iron: Class 125 and 250, ANSI B16.3.
2. Welded:
  - a. Carbon Steel: Long radius, standard weight or extra strong.
  - b. Factory Wrought Steel Buttweld Fittings: ASME B16.9.
  - c. Buttwelding Ends for Pipe, Valves, Flanges and Fittings: ASME B16.25.
  - d. Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures: ASTM A234.

- e. Steel Pipe Flanges and Flanged Fittings: ASME B16.5.
  - f. Forged Steel Fittings, Socket Welded and Threaded: ASME B16.11.
3. Mechanical Fittings and Grooved Couplings:
- a. Couplings: UL 213, AWWA C606, ASTM A536 ductile iron or ASTM A47 malleable iron, with enamel finish and grooves or shoulders designed to accept grooved couplings. Synthetic-rubber gasket with central-cavity, pressure-responsive design and ASTM A183 carbon-steel bolts and nuts.
  - b. FM Global approved.
- D. Anti-Microbial Coating: Factory-applied coating to inhibit corrosion from microbiological organisms.

### **2.03 WALL AND FLOOR PENETRATIONS AND SLEEVES**

- A. Below Grade and High Water Table Areas: Waterproof elastomeric compound.

### **2.04 HANGERS AND SUPPORTS**

- A. General: Select size of hangers and supports to exactly fit pipe size for bare piping.
- B. Hangers: Ferrous.
- C. Hanger Rods: Zinc electroplated carbon steel.
- D. Finishes: Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- E. Materials:
  - 1. Use carbon steel pipe hangers and supports, metal trapeze pipe hangers and attachments for general service applications.
  - 2. Use stainless steel hangers, rods and attachments for corrosive environment applications. Examples of corrosive environment applications include but are not limited to swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries and the like.
- F. Anti-Scratch Padding: Use padded hangers for piping subject to scratching.

### **2.05 STRUTS AND STRUT CLAMPS**

- A. Electro-galvanized steel.
- B. Designed for supporting pipe runs from strut supports.
- C. Strut clamps UL listed for fire protection.

- D. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include but are not limited to swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries and the like.

## **2.06 SWAY BRACES AND RESTRAINTS**

- A. Sway Bracing: From a single manufacturer and compatible with sway brace calculation program.
- B. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include but are not limited to swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries, and the like.

## **2.07 ANCHORS AND ATTACHMENTS**

- A. General: Anchor supports to masonry, concrete and block walls per anchoring system manufacturer's recommendations, or as modified by project Structural Engineer.
- B. Materials:
  - 1. Ferrous.
  - 2. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include but are not limited to swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries, and the like.
- C. Cast in Place Anchors for Hangers: Verify listing is for hangers, braces, or both.
- D. Attachments in Concrete:
  - 1. Suitable for hanging and bracing fire protection systems in concrete which is subject to cracking in a seismic event.
  - 2. Seismic Design Areas C, D, E and F:
    - a. Compatible with International Code Council Evaluation Service Acceptance Criteria AC-193 and AC308 for expansion, screw and adhesive anchors. Meet requirements of ACI 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary.
    - b. All models of Hilti HDI and ITW Red Head Multi-Set II anchors are not approved for attaching fire protection systems in Seismic Design Areas C, D, E and F. No Exceptions.
- E. ITW Buildex Sammys with FM Approval only are not allowed in certain seismic zones. Verify with FM that FM Approval is effective in project's seismic zone.

## **2.08 PIPE STANDS**

- A. Adjustable Pipe Saddle Support with Yoke:
  - 1. Designed to support horizontal pipe from floor stanchion.
  - 2. U-bolt and hex nuts to hold pipe securely to saddle or pipe clamp type.
  - 3. ANSI/MSS SP-69; SP-58. Type 37.
  - 4. Steel pipe with steel saddle.
- B. Base Stand:
  - 1. Steel pipe welded to steel base plate.
  - 2. Meet requirements of 12X anchor diameter hole spacing for seismic applications.

## **2.09 VALVES**

- A. Automatic Air-Release Valve for Wet Systems:
  - 1. Rated to 175 psi.
  - 2. Automatic float-type with shutoff mounted in a water retention pan.
  - 3. Single set 24VAC@2A for electronic supervision.
  - 4. Ball valve switch with cover tamper.
- B. Ball Valves: Brass body, brass stem; forged brass ball disc.

## **2.10 PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION**

- A. Engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker.
- B. Corrosion-resistant chain or permanent adhesive.

## **2.11 SIGNS**

- A. Engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker.
- B. Corrosion-resistant chain or permanent adhesive.

## **2.12 DRAINS**

- A. Reference Aboveground Black Steel Pipe and Fittings.

## **PART 3 - EXECUTION**

### **3.01 GENERAL INSTALLATION REQUIREMENTS**

- A. Install in conformance with UL Listing, FM Approval or ICC-ES requirements and restrictions.

### 3.02 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS

#### A. Piping Routing:

1. Route piping, except as otherwise indicated, vertically and horizontally (sloped to drain). Avoid diagonal runs wherever possible. Orient horizontal routes parallel with walls and beam lines.
2. Install piping as shown or described by diagrams, details and notations on Drawings or, if not indicated, install piping to provide the shortest route which does not obstruct usable space or block access for servicing the building and its equipment.
3. Install piping in concealed spaces above finished ceilings. Prior to design and installation, obtain pre-approval by Architect for exposed piping.
4. In open-to-structure areas which are open to public view, route exposed piping to minimize visual impact. Obtain Architect's and Engineer's approval of exposed piping installation.
5. Coordinate installation with other trades. Route piping as required to avoid building structure, equipment, plumbing piping, HVAC piping, ductwork, lighting fixtures, electrical conduits and bus ducts and similar work. Final location of lighting will have priority over final sprinkler locations. Provide drains to trapped sections of system which result from such routing. Other trades take precedence for installation space.
6. Support piping adjacent to walls, overhead construction, columns and other structural and permanent enclosure elements of the building. Limit clearance to 2-inches wherever furring is indicated for concealment of piping. Allow for insulation thickness. Locate insulated piping to provide minimum 1-inch clearance outside insulation.
7. Wherever possible in finished and occupied spaces, conceal piping from view by locating within column or beam enclosures, hollow wall construction, or above suspended ceilings. Do not encase horizontal routes in solid partitions, except where approved.
8. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms and other electrical or electronic equipment spaces and enclosures. Do not route piping above electric power or lighting panel, switchgear, low voltage panel, or similar electric device.
9. Rooms Protected by Alternative Systems: Route water filled and dry system piping around rooms protected by pre-action systems, clean agent systems, gaseous suppression systems and other alternative fire suppression systems.
10. Install pipe runs to minimize obstruction to other work.

#### B. Couplings:

1. Install where indicated on Drawings and on each side of pieces of equipment to permit easy removal of equipment.

2. Deburr cut edges.
- C. Pipe Penetrations: Wire pipe cutout coupon at point of pipe penetration.
- D. Pipe and Pipe Fittings:
1. Expansion and Flexibility: Install work with due regard for expansion and contraction to prevent damage to the piping, equipment, building and its contents. Provide piping offsets, loops, approved type expansion joints, sway bracing, wire restraints, vertical restraints, flexible couplings or other means to control pipe movement and to minimize pipe forces.
  2. Coordinate support of pipe 4-inches and larger with Structural Engineer.
  3. Provide clearances around piping per NFPA 13.
  4. Install dry and pre-action welded pipe with welds facing vertically up, or where this is not possible, as close as possible to vertical between 46 degrees and 234 degrees. Intent is to minimize corrosion caused by moisture in the bottom of pipes.

### **3.03 WALL AND FLOOR PENETRATIONS AND SLEEVES**

- A. Escutcheons: Install on exposed pipes passing through walls or floors.
1. Pipe Sleeves: Lay out work in advance of pouring concrete and furnish and set sleeves necessary to complete work.
  2. Floor Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1-inch above finished floor. Caulk pipes passing through floor with nonshrinking fire and water resistant grout or approved equivalent caulking compound. Caulk/seal piping passing through fire rated building assembly with UL rated assemblies. Provide fire-rated assemblies per local AHJ requirements.
  3. Wall Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Provide sleeve flush with finished face of wall. Caulk pipes passing through walls with non-shrinking caulking compound. Caulk/seal piping passing through fire-rated building assemblies with UL Listed or FM Approved fire-rated firestopping compound. Provide fire-rated assemblies per local AHJ requirements.
  4. Beam Sleeves: Coordinate with trades for locations of pipe sleeves in reinforced concrete and steel beams. Penetrations must be indicated on structural shop drawings. See Drawings and Specifications for specific sleeve location limitations. Pipe sleeve locations must be indicated on reinforced concrete and steel beam shop drawings. Field cutting of beams not allowed without written approval of structural engineer. No extra costs allowed for failure to coordinate beam penetrations prior to reinforced concrete and steel beam shop drawing submittal.



5. Penetrations in Fire-Rated Wall/Floor Assemblies:
  - a. Reference Division 07, Thermal and Moisture Protection.
  - b. Coordinate with Drawings location of fire rated walls, ceilings and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material.
  - c. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814 and NFPA.
  - d. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814.

#### **3.04 HANGERS AND SUPPORTS**

- A. Installation of pipe hangers, inserts and supports to conform to NFPA 13. Provide adjustable hangers, inserts, brackets, clamps, supplementary steel and other accessory materials required for proper support of pipelines and equipment. Provide supplementary materials for proper support and attachment of hangers.

#### **3.05 STRUTS AND STRUT CLAMPS**

- A. Install per manufacturer's listed orientation.

#### **3.06 SWAY BRACES AND RESTRAINTS**

- A. Locate per orientation and spacing as required by sway brace calculations.
- B. Attach sway bracing directly to pipe or equipment being braced.
- C. Do not attach sway bracing to bottom of truss members.

#### **3.07 ANCHORS AND ATTACHMENTS**

- A. Make available to the Architect information required to verify the anchorage, sway bracing and restraint of fire protection systems.

#### **3.08 VALVES**

- A. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.
- B. Install valves where required for proper operation, testing and drainage. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install conveniently and accessibly located with reference to finished building for repairs, removal and service.
- C. Pressure Relief Valves: Provide piping to permanent drain.

### **3.09 PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION**

- A. Install engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker, secured with corrosion-resistant chain or permanent adhesive on or near each item of fire suppression equipment and each operational device, as specified in this specification if not otherwise specified for each item or device.
- B. Provide signs for the following general categories of equipment and operational devices: Valves, drains, pumps, standpipes, tanks and similar equipment.
- C. Each new piece of equipment to bear a permanently attached identification plate, listing manufacturer's name, capacities, sizes and characteristics.
- D. Piping to bear the manufacturer's name, schedule of thickness, size and ASTM identification number
- E. Provide valve tag on every valve, control device, main drain, auxiliary drain, and drum drip in each system. Exclude check valves and valves within factory fabricated equipment units. List each tagged valve in valve schedule for each piping system.
- F. List each tagged item and its location in valve schedule; identify on fire suppression drawings.
- G. Install framed, glass or rigid transparent plastic covered, mounted valve schedule and valve location drawing in main riser or fire pump room.
- H. Provide identification sign on ceiling tile below valve location.
- I. Provide permanent identification sign at pressure regulating valves stating required setting of pressure regulator.
- J. Adjusting: Relocate fire suppression identification device which has become visually blocked.
- K. Cleaning: Clean face of identification devices and glass frames of valve charts.

### **3.10 SIGNS**

- A. General Information Signs: Provide a general information sign used to determine system design basis and information relevant to the inspection, testing and maintenance requirements required by NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems. Such general information is to be provided with a permanently marked weatherproof metal or rigid plastic sign, secured with corrosion-resistant wire, chain, or other acceptable means. Such signs are to be placed at each system control rise loop and auxiliary system control valve. The sign is to include the following information:
  - 1. Name and Location of the Facility Protected
  - 2. Presence of High-Piled and/or Rack Storage
  - 3. Maximum Height of Storage Planned

4. Flow Test Data
5. Location of Auxiliary Drains and Low Point Drains
6. Original Results of Main Drain Flow Test
7. Name of Installing Contractor or Designer
8. Indication of presence and location of other auxiliary systems.

### **3.11 DRAINS**

- A. Locate drain connections within 7-feet of floor. Provide piping capable of being fully drained.
- B. Provide a drain vent at top of vertical drains. Coordinate with Division 22, Plumbing.
- C. Coordinate location of auxiliary drains with Architect. Architect to approve location before drain is installed.
- D. Protect drains from tampering and accidental operation.
- E. Protect drain discharge at the exterior with a turned-down 45 degree elbow.

### **END OF SECTION**

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## **SECTION 21 13 00 – FIRE SUPPRESSION SPRINKLER SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

- A. Work Included:
  - 1. Sprinklers
  - 2. Spare Sprinkler Cabinet
  - 3. Sprinkler Guards
- B. This is a contractor designed system. Contact AHJ prior to bid to verify fire system requirements. Provide design compliant with codes as interpreted by AHJ.
- C. Scope: Revision and extension of existing wet-pipe sprinkler system to provide coverage throughout the library.
- D. Coordinate location and type of tamper, flow and pressure switches and fire alarm system.
- E. Provide electrical connections and wiring as required for a complete and operable system. Includes but is not limited to bells and monitoring of sprinkler system valves.

#### **1.02 RELATED SECTIONS**

- A. Contents of Division 21, Fire Suppression and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
  - 1. Division 22, Plumbing
  - 2. Division 23, Heating, Ventilating and Air-Conditioning
  - 3. Division 26, Electrical
  - 4. Division 28, Electronic Safety and Security
  - 5. Section 21 00 00, Fire Suppression Basic Requirements
  - 6. Section 21 05 00, Common Work Results for Fire Suppression

#### **1.03 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

#### **1.04 SUBMITTALS**

- A. Submittals as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

- B. In addition, provide:
  - 1. Hydraulic calculations.
  - 2. Sway brace calculations.
  - 3. Details of sway bracing.
  - 4. Details of interval and end of branch line restraints.
  - 5. Details of flexible sprinkler hose fitting assembly, including number and radius of bends, corresponding to equivalent feet used in hydraulic calculations. Provide details
  - 6. Trapeze hanger details and calculations, including size, length and material. Additionally, provide size, weight and number of pipes to be carried on the trapeze.
  - 7. On submittal and As-Built drawings, provide text of sprinkler list to be installed in the spare sprinkler cabinet.

#### **1.05 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

#### **1.06 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

#### **1.07 SYSTEM DESCRIPTION**

- A. Provide coverage for entire building. Field verify field conditions prior to submittal of bid. Adjust bid to provide protection features in accordance with applicable codes and interpretations by AHJ. Provide design and installation based on more stringent requirements if this specification and AHJ requirements differ from Code.
- B. Design Parameters:
  - 1. Increase remote area for sloped roofs and concealed areas per NPFA 13.
  - 2. Building Areas: Library, staff areas, community rooms.
    - a. Occupancy Classification: Light.
  - 3. Building Areas: Mechanical rooms, Electrical rooms.
    - a. Occupancy Classification: Ordinary Group 1.
  - 4. Building Areas: Storage rooms.
    - a. Occupancy Classification: Ordinary Group 2.

5. Design parameters above are NFPA 13 minimums. Provide increased design densities, design areas and hose allowances to meet requirements of AHJ.
- C. Sprinkler system design to include a 10 percent pressure and flow cushion between system demand point and available water supplies.
- D. Extend hydraulic calculations from hydraulically most remote design area back to location of pressure hydrant or flow test or effective point of water supply where characteristics of water supply are known.

#### **1.08 EXTRA STOCK**

- A. Provide extra sprinklers per code.
- B. Provide suitable wrenches for each sprinkler type and metal storage cabinet in riser room.

#### **1.09 CONTROL VALVES**

- A. Sprinkler system control valves to be butterfly valves located inside building.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Sprinklers:
  1. Finished Areas:
    - a. Victaulic
    - b. Viking
    - c. Tyco
    - d. Reliable
    - e. Globe
    - f. Senju
    - g. Or approved equivalent.
  2. Nonfinished Areas:
    - a. Victaulic
    - b. Viking
    - c. Tyco
    - d. Reliable
    - e. Globe

f. Or approved equivalent.

B. Spare Sprinkler Cabinet:

1. Victaulic
2. Fire Protection Products, Inc. (FPPI).
3. Tyco Fire & Building Products
4. Allied Rubber and Gasket Co.
5. Potter Roemer Fire Pro.
6. Or approved equivalent.

C. Sprinkler Guards:

1. Victaulic
2. Viking
3. Tyco
4. Reliable
5. Globe
6. Senju
7. Or approved equivalent.

**2.02 SPRINKLERS**

A. Finished Areas:

1. Type: Glass-Bulb
2. Style: See drawings.
3. Response: Quick-Response
4. Finish: Architect to select from standard finishes.
5. Escutcheon: White Polyester

B. Nonfinished Areas:

1. Type: Glass-Bulb
2. Response: Quick-Response
3. Finish: Brass



- C. Pendent sprinklers supplied by dry or preaction piping: Dry pendent type.

### **2.03 SPARE SPRINKLER CABINET**

- A. NFPA 13 Systems: Sized to accommodate a minimum of two spare sprinklers of each Sprinkler Identification Number (SIN), manufacturer, model, orifice, deflector type, temperature and thermal sensitivity, or a minimum of six sprinklers for facilities having under 300 sprinklers, or a minimum of 12 sprinklers for facilities having 300 to 1000 sprinklers, or a minimum of 24 sprinklers for facilities having over 1000 sprinklers, whichever is more.
- B. Welded steel with hinged steel cover; red enamel or polyester coated finish inside and out.

### **2.04 SPRINKLER GUARDS**

- A. Metal.
- B. Listed for use with sprinkler model to which it is attached.

## **PART 3 - EXECUTION**

### **3.01 GENERAL INSTALLATION REQUIREMENTS**

- A. Install per manufacturer's requirements and recommendations.

### **3.02 SPRINKLERS**

- A. Center sprinklers in center or quarter points of suspended ceiling tile.
- B. Align sprinklers with architectural column lines, lighting, diffusers and other ceiling features. In unfinished ceilings, route piping to minimize visual impact. Sprinklers and piping not so aligned are to be removed and replaced at no additional cost to Owner.

### **3.03 SPARE SPRINKLER CABINET**

- A. Attach to wall at the main sprinkler system riser.
- B. Locate so cover is easy to open and readily accessible.
- C. Locate in an area with a temperature between 40 and 100 degrees Fahrenheit.
- D. Locate sprinkler wrenches inside cabinet.
- E. Inside the cabinet, provide a list of sprinklers installed in the property, including sprinkler identification number, manufacturer, model, orifice, deflector type, thermal sensitivity and pressure rating, quantity of each type to be contained in the cabinet and issue or revision date of the list.

### **3.04 SPRINKLER GUARDS**

- A. Install per manufacturer's instructions and recommendations.

## **END OF SECTION**

January 18, 2021  
Bid Set

Petaluma Regional Library Refresh  
Petaluma, California

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## SECTION 22 01 00 – GENERAL REQUIREMENTS

### PART 1 – GENERAL

#### 1.01 DESCRIPTION

- A. Comply with the requirements of DIVISION 1.
- B. The requirements of this SECTION apply to all work of this DIVISION.
- C. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment, which is shown or listed, provide an item which will allow the system to function properly at no increase in the Contract Amount.

#### 1.02 QUALITY ASSURANCE

- A. Related Work Specified Elsewhere:
  - 1. Refer to DIVISION 26 for all electrical wiring (except that specifically indicated on Control Drawings) for motor starters (except pre-wired packaged systems, in which case they must conform to DIVISION 26).
- B. Examination of the Site:
  - 1. Visit the site prior to bidding. Take measurements and such other information as to locations, depths, capacities and sizes of existing piping and ductwork to which connections may be made or which may be abandoned or which require rerouting. If any of the above requires extra work due to discrepancies or omissions on the drawings if such omissions or discrepancies have been revealed by examination before bidding, the Contractor should report the discrepancy to the Architect a minimum of three days prior to receipt of bids. If additional work is required due to omissions and discrepancies after the contract for the work is signed and if such omissions or discrepancies would have been revealed by a visit to the site before receipt of bids, then the corrective additional work shall be performed at no additional cost to the Owner.
- C. Requirements of Regulatory Agencies:
  - 1. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the Architect for approval. If an

organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable testing and is approved by the Architect. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard.

2. Any specific reference in these Specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at date of submission of Bid, unless the Document is shown dated.
3. Perform the work in conformance with the applicable requirements of all regulatory agencies, including, but not limited to the following:
  - a. National Electrical Code.
  - b. Uniform Plumbing Code.
  - c. International Building Code
  - d. California Code of Regulations (CCR).
    - (1) Title 8, Division 1, Chapter 3.2 - California Occupational Safety and Health Regulations (CAL/OSHA).
    - (2) Title 8, Division 1, Chapter 4 - Safety Orders.
    - (3) Title 24, Building Standards.
      - (a) Part 2 - California Building Code
      - (b) Part 3 - California Electrical Code
      - (c) Part 4 - California Mechanical Code
      - (d) Part 5 - California Plumbing Code
      - (e) Part 6 - California Energy Code
      - (f) Part 9 - California Fire Code
    - (4) Acceptance Requirements of California Energy Code: Perform work necessary to complete the Acceptance Requirements of the California Energy Code, including but not limited to:
      - (a) Testing of minimum ventilation controls, zone temperature and scheduling controls, duct leakage, Air-side economizer controls, demand control

ventilation systems, fan volume controls, variable flow controls for hydronic systems, isolation valves on chillers and boilers, supply water reset controls, water-loop heat pump isolation valve controls, and variable frequency drive pump systems

- (b) Reviewing plans and specifications to ensure conform to the Acceptance Requirements
  - (c) Perform construction inspection prior to testing to ensure that the equipment installed is capable of complying with the requirements of the Standards, the equipment is installed correctly and calibrated.
  - (d) Undertake all required Acceptance Requirement procedures and identify all performance deficiencies, ensuring that they are corrected. Document the results of the Acceptance Requirement procedures on the Acceptance Test forms and indicate satisfactory completion by signing the Certificate of Acceptance.
- 4. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules, regulations.
  - 5. When Drawings or Specifications exceed requirements of applicable laws, ordinances, rules, regulations, Drawings and Specifications take precedence.
  - 6. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.
  - 7. Work herein shall comply with all applicable requirements of CCR Title 8, Division 1, as they apply to this project, both in reference to Contractor's operations in performing his work and also in construction result to be accomplished. Where an omission or a conflict appears between OSHA requirements and the Drawings and Specifications, OSHA requirements shall take precedence.
- D. When there is an ambiguity or discrepancy between Drawings and Specifications the more stringent requirement of the two shall be provided.
  - E. Licenses, Permits and Fees
    - 1. Provide, procure and pay for all permits, licenses, fees, etc., required to carry on and complete the Mechanical Work. Contact all applicable utility authorities and include in bid all fees, charged by any such authorities.
  - F. Operating and Maintenance Instruction:
    - 1. Furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation, and maintenance,

including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man-days (8 hours) of instruction furnished shall be 1.

### 1.03 SUBMITTALS

#### A. General

1. Submit shop drawings, catalog data, supplemental data, for all materials, equipment in all Sections of this and as specified hereinafter.
2. Four weeks after award of the Contract, or earlier it deemed appropriate by the Architect, submit a schedule of all submittals with the date of each equipment submittal or shop drawing submittal clearly indicated.
3. Forward all submittals to Architect, together, at one time. Individual or incomplete submittals are not acceptable. Six (6) copies are required.
4. Submittals shall have been reviewed and stamped by the General Contractor in accordance with the requirements of the GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION. Submittals not so stamped will be returned without review.
5. The contractor shall allow for adequate time for submittal review by the engineer. In general, the contractor shall allow for a minimum of 15 working days from the day the general contractor sends the submittal to the architect to the day the architect returns the submittal to the general contractor. Additional time shall be allowed for large or complex submittals.
6. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
7. Identify each submittal item by reference to Specification SECTION Paragraph in which item is specified or drawing and detail number.
8. Organize submittals in same sequence as they appear in specification sections, articles, or paragraphs.
9. Submit signed Acceptance Test forms indicating completion of California Energy Code Acceptance Test requirements.

- B. Electronic Submittals: Electronic submittals is the preferred method of review. Follow these procedures:

1. Provide one pdf file for each submittal. PDF file must be unlocked, editable and printable to accommodate electronic mark-ups or printing a hard copy from markup.
  2. Electronic submittals are to be complete and self-contained with each item requiring Architect's action highlighted.
  3. Web links or other electronic submittals requiring the Architect to surf websites or navigate to find documents on websites or posting services are not acceptable.
  4. The use of construction phase file hosting services or programs such as BIM 360 or Prolog or Primavera may not be used before prior approval from the Architect.
  5. Any electronic submittal procedures should not require the Architect to search for submittals but should follow procedures that are the electronic equivalent of hard copy submittals sent by Contractor to the Architect in a manner acceptable to the Architect including indexing requirements mentioned below.
  6. No electronic submittals for samples (if needed) will be permitted.
  7. Architect will return one marked up electronic submittal for Contractor to process and distribute to subcontractors and for Owner according to agreed procedure.
  8. On each electronic submittal, provide Contractor review and approval stamp.
- C. Indexing:
1. Submittals shall be indexed according to specification DIVISION and SECTION number and paragraph to identify each item. Sporadic submittals, incomplete data, or unidentified data, or data not showing features to coordinate item with other work will not be accepted.
- D. Submittal literature, Drawings and wiring diagrams shall be specifically applicable to this project and shall not contain extraneous material. The literature shall be clearly marked to indicate the proposed item and any accessories or options to be furnished. Submittals shall include, but not be limited to the following:
1. Valves with Service and Location, Motors \* Drives and Guards
  2. Pipe Trim, Hangers and Seismic Bracing, Insulation, Vibration Isolators, Heat Exchangers
  3. Tanks, Vents, Pumps\*
  4. Fixtures, Fixture Trim, Medical Gas Equipment

Notes:

\* Include a family of rating curves. See applicable specification section.



- E. Resubmittals shall respond to comments made on the original submittal and shall be marked with a resubmittal number and dated. Resubmittals not in conformance with these requirements will be returned without review.
  
- F. Shop Drawings: (Also see Division 1 requirements)
  - 1. Submit shop drawings for piping, and equipment. Do not begin fabrication until shop drawings have been coordinated with all trades and have been reviewed and accepted by the Architect.
  
  - 2. Drawings shall be a minimum of 8-1/2 inches by 14 inches in size, with a minimum scale of 1/8 inch per foot, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, and other items that must be shown to assure a coordinated installation. Piping layouts and Mechanical Room layouts shall be drawn at a minimum scale of 1/4 inch per foot. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
  
  - 3. The Architect's review of Shop Drawings is not intended to verify dimensions or quantities, nor to coordinate items shown on these Drawings. He will review them for general conformance with design concept of the project and general compliance with the information given in the contract requirements of the plans and Specifications. Contractor is responsible for dimensions, which shall be confirmed and correlated at the job site, for fabrication processes and techniques of construction, for coordination of his work with that of all other trades and the satisfactory performance of his work.
  
- G. Record Drawings
  - 1. Installation drawings shall be drawn at the site by the Contractor on reproducible paper and shall be fully coordinated for interferences by all trades. The Contractor shall maintain at the jobsite a complete set of prints of the installation drawings for all mechanical work. These prints shall be kept up to date by recording all changes daily. The progress of the work shall be clearly, neatly and accurately designated, coloring in the various pipes, and equipment as they are erected. This process shall incorporate all changes to the original drawings including formal change orders or other instructions issued by the Architect. Principal dimensions of all concealed work shall be recorded including inverts of buried piping and height to underside of pipes.
  
  - 2. These marked up prints will be used as a guide for determining the progress of the work installed. They will be inspected monthly by the Architect and shall be corrected immediately if found either inaccurate or incomplete.

3. Prior to final acceptance of the Work of this Division, submit properly certified Record Drawings to the Architect for review and make changes, corrections, or additions as the Architect may require. After the Architect's review and any required Contractor revisions, deliver the Record Drawings to the Owner on electronic media in AutoCAD format. The Architect and Engineer do not assume any responsibility for the accuracy or completeness of the Record Drawings.
- H. Operating & Maintenance Manuals:
1. Manuals shall conform as required by Division 1.
  2. Furnish an operation and maintenance manual for each item of equipment. Furnish 5 copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed, and furnish the remaining manuals before the contract is completed. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation and shutdown; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shutdown instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.
  3. Submit a DVD disk containing all Operations and Maintenance data in Adobe "pdf" format. Also include an index of Internet web site addresses Section No. and title, equipment name, Web site address for the O&M manual of the equipment, and the O&M Manual filename.
- I. Letters from manufacturers certifying their supervision of equipment installation and start-up procedures.
- J. Three (3) copies of certification signed by Owner's representative, attesting to their receipt of instructions required by paragraph "Operation and Maintenance Instruction" of this Section.

**1.04 PRODUCT DELIVERY AND STORAGE**

- A. Identify materials and equipment delivered to site to permit check against approved materials list, reviewed shop Drawings.
- B. Protect from loss or damage. Replace lost or damaged material and equipment with new at no increase in the Contract Amount.
  - 1. Store material in clean, dry locations. Store material off of floor, and wrap material or otherwise protect from contamination by construction debris, dust, etc. Follow manufacturer's recommendation for storing the material at all times.

**1.05 DRAWINGS AND COORDINATION WITH OTHER WORK**

- A. Contract Drawings:
  - 1. For purposes of clarity, legibility, the Contract Drawings are essentially diagrammatic to extent that many offsets, bends, unions, special fittings are not shown. Exact locations of items are not indicated, unless specifically dimensioned.
  - 2. Exact routing of piping shall be governed by structural conditions, obstructions. Contractor shall make use of data in Contract Documents. Architect reserves right, at no increase in price, to make any reasonable change in location of mechanical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility. Verify Architect's requirements in this regard prior to roughing-in.
  - 3. In addition to the Shop Drawings called for under SUBMITTALS the Contractor shall prepare large scale layout drawings showing location of equipment, piping runs, and all other elements of mechanical systems provided under this DIVISION. Include sections of congested areas to show relative position and spacing of affected elements.
  - 4. Refer to the electrical "E" series drawings and specifications, Division 26 for the service voltage, power feed, control and interlock wiring for equipment specified under this section. Review the electrical "E" series drawings and Division 26 documents to verify that the electrical services (power, control, interlock, etc.) provided are adequate and compatible with the equipment requirements. Include the cost to furnish and install the additional electrical services, if it is required over and above what is indicated on the electrical "E" series drawings and in Division 26, such as additional control interlock conductors, larger feeder, or separate 120V control power source.
    - a. Prior to proceeding with the installation of any additional electrical work, submit detailed drawings indicating the exact scope of additional electrical work to the Architect for review and approval.

5. Provide templates, information, and instructions to other DIVISIONS to properly locate holes and openings to be cut or provided for electrical Work.
  6. Not all offsets in piping are shown. Decide which item to offset or relocate. Maintain required slope in piping.
- B. Coordination:
1. Work out all "tight" conditions involving Work under this DIVISION and Work in other DIVISIONS in advance of installation.
  2. Maintain minimum 1 inch clearance from adjacent work, including piping, ductwork, insulation, etc. except as noted or approved.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two year use shall include applications of equipment and materials under similar circumstances and of similar size.
- B. Alternative Service Record: Products having less than a two-year field service record may be acceptable on approval of the Architect if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.
- C. Service Support: Major equipment items shall be supported by service organizations. The Contractor shall submit a certified list of qualified permanent service organizations for support of the equipment, which includes their addresses and qualifications. These service organizations shall be reasonably convenient to the equipment installation and able to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- D. Identify materials, equipment by manufacturer's name, nameplate data. Remove unidentified materials, equipment from site.
- E. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.
- F. Where no specific make of material or equipment is mentioned, any first class product of reputable manufacturer may be used, provided it conforms to requirements of system and meets acceptance.

### **2.02 SUBSTITUTIONS**

- A. Where more than one specific name is used, it is to be understood that the name mentioned first represents the manufacturer whose equipment has been used as the basis of design. All other names mentioned are to be considered substitutions within the meaning of this paragraph, and no additional cost to the Owner shall accrue due to any revisions, additions or deletions required to make substituted equipment perform in accordance with the plans and specifications.
- B. Any redesign necessitated by substitutions shall be provided by the Contractor and shall be subject to review and approval by the Architect.
- C. Substitutions will not be considered if they are indicated or implied on Shop Drawings or Project Data Submittal without the formal request required by Division 1.

### **PART 3 – EXECUTION**

#### **3.01 DEMOLITION**

- A. Remove all piping, fixtures, equipment, etc., where shown or otherwise indicated to be removed. Cap piping at mains or source.

#### **3.02 INSTALLATION**

- A. Manufacturer's Recommendations
  - 1. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, printed copies of these recommendations shall be furnished prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
  - 2. Provide complete systems in accordance with manufacturers' requirements.
  - 3. Where dimensions or specific installation and operating instructions of equipment are not provided in the Drawings or Specifications, perform the Work according to approved manufacturer's specifications and recommendations. Any material and work required under this heading shall be supplied at no additional cost to the Owner.
  - 4. Assemble equipment which is required to be field assembled, under the direct supervision of the manufacturer's agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- B. Equipment: Accurately set and level with supports neatly placed and properly fastened. Properly fasten equipment in place with bolts to prevent movement in earthquake. No allowance of any kind will be made for failure on part of Contractor to foresee means of bringing in or installing equipment into position inside building.
- C. Piping Systems:

1. Worked into complete, integrated arrangement with like elements to make work neat appearing, finished.
  2. Run concealed, except as shown or noted otherwise; where exposed, run parallel with walls or structural elements; vertical runs plumb; horizontal runs parallel with structure and level or uniformly pitched as appropriate.
  3. Install with adequate passageways free from obstructions, as high as practicable to maintain adequate head room, as shown or as required. Notify Architect before installation whenever head room of less than 7-feet 6-inches will result. Coordinate with work of other DIVISIONS to achieve proper head room as specified in this DIVISION.
  4. Provide bases, piers, metal frames and backings, hangers and supports for the fixtures and systems furnished under this DIVISION.
  5. Expansion and Contraction: Make adequate provisions, whether those provisions are shown on Drawings or not.
  6. Cleaning and Closing: Inspect all piping and equipment before placing; clean interior before closing. Close all piping at end of each day's work.
- D. Sleeves, Chases, and Concrete Inserts:
1. Cutting and Patching: In accordance with architectural specifications: "CUTTING AND PATCHING".
  2. Provide, to cause no delay, all required sleeves, chases, inserts, anchor bolts, etc., and be responsible for correct location, installation of same.
  3. Locating and sizing of openings for pipes through walls, etc., under this DIVISION. Framing of openings provided by respective DIVISIONS in whose work opening is made.
  4. Penetrations of fire or smoke rated walls, partitions, and floors:
    - a. Pack space between piping and sleeve or opening with materials approved by Underwriters Laboratories for use in through-penetration fire stop systems. Materials, methods, and installation shall be in accordance with UL approved listings and shall be designed to act as a firestop as well as a cold smoke, noxious gas, and water sealant. Submit UL listings for all such systems to be used.
    - b. Through-penetrations of fire rated walls shall be protected by an approved through-penetration firestop system installed as tested in accordance with ASTM E814 or UL1479, and shall have an F rating of not less than the required fire-resistance rating of the wall penetrated.
    - c. Through penetrations of horizontal assemblies that are not contained inside fire-rated shafts shall be protected by an approved through-penetration firestop system installed as tested in accordance with ASTM E814 or UL1479, and shall have an F and T rating of not less

than 1 hour and not less than the required fire-resistance rating of the floor penetrated.

(1) Floor penetrations contained and located within the cavity of a wall above or below the floor do not require a through-penetration firestop system with a T rating.

5. Pipe Sleeves: Where not otherwise indicated or specified, sleeves through outside walls, floors or roof slabs shall be zinc coated steel pipe conforming to ASTM A53. Sleeves through inside partitions shall be zinc coated sheet steel not less than 0.0217-inches thick conforming to ASTM A653.

E. Cutting and Repairing:

1. Do all cutting, repairing, including structural reinforcing, necessary for Work under this DIVISION.
2. Do no cutting or patching without Architect's review. Repair damage done by this cutting equal to original condition in Architect's opinion.
3. Assume responsibility for all damage to any part of premises or Work of other DIVISIONS, caused by leaks or breaks in piping or equipment furnished and/or installed under this DIVISION during construction and guarantee period.

**3.03 TESTING AND ADJUSTING**

- A. Do not start or operate any equipment until the unit as well as all services connected thereto have been supported and seismically braced. Services connected to equipment includes piping and its in-line components, wiring, or other in-line components.
- B. Furnish all labor and test equipment required under this DIVISION; and in accordance with SECTION 220593; and as follows.
- C. Clean and purge equipment and piping before each test.
- D. Test various plumbing systems in portions as work progresses. Any system or portion previously tested shall become part of any repeated test when it becomes part of distribution or collection system.
- E. Repair leaks by remaking with new material. Makeshift leak stopping methods are not acceptable.
- F. Should any piece of equipment or material fail in any of the tests, immediately remove, replace with new; retest system.
- G. Maintain test pressures for periods stated, or as directed without loss in pressure, except that due to change in temperature or atmospheric pressure during test.

- H. Perform all tests in accordance with the requirements and under supervision of authorities having jurisdiction.
- I. Water Prebalancing Requirements:
  - 1. Complete and test all systems early enough to enable completion of water balancing prior to Owner move in.
  - 2. Complete or perform the following Work prior to commencement of the balancing procedure:
    - a. Testing of all systems.
    - b. Prior to the start of balancing, complete all punch list items that will affect balancing of the system.
    - c. Install all balancing devices shown and specified and check to be sure they are properly installed, indexed, and in good working order.
    - d. Schedule the Work of all other trades to eliminate system shutdown for any reason once balancing is started.
    - e. Schedule the Work of other trades to assure uninterrupted access to mechanical equipment rooms as well as balancing devices.
    - f. Provide labor and material necessary to perform any system revisions required to allow completion of balancing.
    - g. Set all balancing cocks to 100-percent open position.
  - 3. When all the above testing and adjusting Work has been completed, submit a written statement to the Architect, stating that all the testing and prebalancing requirements have been met. Final Balancing shall not begin until the certificate has been approved by the Architect.
- J. At completion of Work, provide written certification that all systems are functioning properly without defects.

### **3.04 CLEANING AND PAINTING**

- A. Refinish Work supplied with final finish under this DIVISION if damaged to satisfaction of Architect.
- B. Thoroughly clean all equipment, piping and all other materials under this DIVISION free from all rust, scale, and all other dirt before covering or painting is done, or the systems put in operation. Leave in condition satisfactory to the Architect.
- C. Thoroughly flush out all domestic water piping with domestic water under pressure before faucets, flush valves and other constantly operated devices are installed.
- D. Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.



- E. Any insulation damaged shall be repaired.
- F. At all times keep the premises free from accumulation of waste material and debris caused by his employees. At the completion of the project, remove refuse from within and around the building. All tools, scaffolding and surplus materials shall also be removed, leaving the site of his Work broom clean.
- G. Completely cover all sprinkler heads and all motors and other moving machinery to keep free of dirt and water during construction. Using Visqueen EcoMembrane or other 100% post-use low density polyethylene sheet membrane material, effectively cap all openings into pipes to keep foreign matter out during construction.
- H. Properly prepare Work under this DIVISION to be finished painted under architectural specification section, "PAINTING".
  - 1. All exposed work which in general includes piping, insulation, metal items, equipment and supports shall be painted except that polished aluminum, stainless steel, chrome plate and other finely finished materials shall not be painted unless otherwise noted.
  - 2. Unless otherwise noted all finish colors shall be selected by the Architect.
  - 3. Materials previously shop prime coated by the manufacturer and which have been scuffed or otherwise damaged shall be touched up with the same materials used for priming. Prime coats shall be of a lighter tint than final coats.

### **3.05 SIGNS, LABELS AND IDENTIFICATION FOR PIPING, VALVES AND EQUIPMENT**

- A. Signs and Labels:
  - 1. Fasten a red-headed tack to each T-bar suspended ceiling pushout tile at any equipment, component or control devices, requiring maintenance or access.
  - 2. A printed sign shall be posted at water treating equipment stating, "USE NO CHROMATES".
  - 3. Post a printed sign at each automatically started equipment stating, "WARNING THIS MACHINE IS AUTOMATICALLY CONTROLLED AND MAY START AT ANY TIME".
- B. Pipe Identification:
  - 1. Identify and color-code all piping including piping in furred ceiling spaces. Provide directional arrows on circulating systems. Identification shall be in accordance with ANSI A13.1-2013, Scheme for Identification of Piping Systems, and as specified herein.
  - 2. Clearly identify potable and recycled water systems as required by 2013 CPC:
    - a. Potable water system: Green background with white lettering.

3. Plastic Markers: Seton Setmark, or equal, for concealed locations or if located in mechanical rooms; or Seton Opticode, or equal, for exposed pipes in public areas, with wording as selected by the Architect. Each marker must show approved color-coded background, proper color of legend in relation to background color, approved legend letter size, approved marker length.
  4. Location for Pipe Identification:
    - a. Adjacent to each valve and fitting (except on plumbing fixtures and equipment).
    - b. At each branch and riser take-off.
    - c. At each pipe passage through wall, floor and ceiling construction.
    - d. On all horizontal runs spaced 25-feet maximum but not less than one per room.
- C. Valve Identification:
1. Provide tags on all control and line shut-off valves. Tags shall note valve service and number as hereinafter specified and shall be Seton Style
    - a. 250-BL, Brady, or equal, brass tag fastened to the valve stem with copper wire.
  2. Provide three (3) typewritten schedules giving numbers, service and locations, and notations of normally open or closed, of all tagged valves, where purpose of location is not easily identifiable. Enclose each schedule in separate transparent plastic binder.

### **3.06 EQUIPMENT IDENTIFICATION**

- A. Properly identify each piece of equipment and its controls using engraved laminated plastic descriptive nameplates, attached to equipment and controls using round head brass machine screws, pop rivets or contact cement. Cardholders in any form not acceptable.
- B. All equipment that is appurtenant to the recycled water system shall be painted purple to match the Mylar wrapping tape.
- C. For equipment installed under a raised floor, properly identify each control valve and other equipment requiring maintenance or access. Such identification shall be approved by the Architect and located at the carpet tile or top of raised floor, at the ceiling or other location approved by the Architect.
- D. All equipment identification shall include the year the equipment was installed.

**END OF SECTION**

**SECTION 22 05 00 – BASIC MATERIALS AND METHODS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. The requirements of this SECTION apply to all Work of this DIVISION, where applicable. The materials, equipment and methods herein are generally common to the various SECTIONS of this DIVISION of the Specification. Materials that apply to only one SECTION are generally included in that SECTION. Where items specified in other SECTIONS of this DIVISION conflict with requirements of this SECTION, the former shall take precedence.

**1.02 QUALITY ASSURANCE**

- A. Equipment and Accessories
  - 1. Supply all equipment and all accessories new, free from defects.
  - 2. All items of a given type shall be the product of the same manufacturer.
  - 3. Electrical Equipment: Listed by U.L. and bearing their label.
- B. Reference Standards: Refer to individual Mechanical SECTIONS for additional reference standards.
  - 1. ANSI/ASME - B31.9 Building Services Piping
  - 2. ANSI B2.1 - Pipe Threads
  - 3. ASTM D1557 - Test Methods for Moisture Density Relationships of Soil and Soil Aggregate Mixtures.
  - 4. ASTM D2235 - Solvent Cement for ABS Plastic Pipe and Fittings.
  - 5. ASTM D2564 - Polyvinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings.
  - 6. ASTM D2657 - Heat-Joining Polyolefin Pipe and Fittings.
  - 7. ASTM F493 - Solvent Cements for Chlorinated Poly(vinyl chloride) Plastic Pipe and Fittings.
  - 8. AWWA C209-83 - Cold applied tape coatings for exterior of connections and fittings for steel water pipe lines.
  - 9. AWWA C214-83 - Tape Coating Systems for exterior of steel water pipe lines.
  - 10. AWWA C510-17 Double Check Valve Backflow Prevention Assembly.
  - 11. AWWA C511-17 Reduced-Pressure Principle Backflow Prevention Assembly

12. ASC - Adhesive and Sealant Council.
13. Copper Development Association - Copper Tube Handbook.
14. NEMA-MG1 National Electrical Manufacturer's Association, Motor and Generator Standards.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Access Doors in Ceilings or Walls:
  1. Furnish under this DIVISION where shown, or required by Regulatory Agencies and for access to all concealed valves, shock absorbers, unions, etc., even though access doors are not shown for Plumbing Work. Mark each door to establish its location and deliver doors for installation under architectural specification sections. Access doors shall be as specified in architectural specification sections.
  2. Unless otherwise shown or designated, access doors for reaching valves, traps, air vents, and cleanouts set in walls shall be 12" x 12" for reaching small items within wrist reach of walls, or 24" x 24" for larger items, or items at greater distances than wrist reach, or at ceilings. All ceiling access door locations shall be coordinated with Architectural Reflected Ceiling Plan.
  3. Access doors are not required in T-bar suspended pushout ceilings or accessible tile ceilings.
  4. For any access door not specifically shown on reflected ceiling plans or Architectural elevations, obtain the Architect's approval of the location, size and type.
  5. Access doors shall be Milcor, Bilco, or equal.
    - a. Style A for acoustic tile. Size of this unit must exactly fit single or multiple acoustic tiles.
    - b. Style K for plaster surfaces.
    - c. Style M for masonry, tile, wall board and other non-plastered surfaces.
    - d. U.L. 1 hour B label for one-hour fire rated surfaces.
- B. Piping Schedules:
  1. Refer to individual Plumbing SECTIONS for general information, materials, and execution of the proper piping for each system.
- C. Valve Schedules: See Valve Schedules in SECTION 220523: VALVES

- D. Dielectric Waterways or Dielectric Flanges: Victaulic Clearflow, Watts, or equal.
- E. Escutcheon: Beaton, Corbin, or equal.
- F. Pipe Hangers: See schedule on Drawings, and individual mechanical specification SECTIONS; see also SECTION 220548: NOISE, VIBRATION, AND SEISMIC CONTROL.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION**

- A. Installation of Piping:
  - 1. Definition of "PIPING": The term "piping" as used in Drawings or these Specifications, means all pipe, fittings, nipples, valves, unions, etc., as may be required for a complete, functional system.
  - 2. The general layout of piping on the drawings indicates branch runouts terminated at individual or groups of fixtures or equipment. The piping shall be considered continuous and finally connected to all fixtures and equipment.
  - 3. Run all pipes in the approximate locations shown. Sizes are given on the Drawings. Unless otherwise shown, lines shall be installed in furred spaces. Offset piping wherever necessary to obtain headroom. In all cases, install pipe lines to conform to actual conditions such as offsetting to clear structural members, lights, ducts, etc. Run all piping true to line and grade. The finished work shall present a neat and workmanlike appearance. Unless otherwise noted, minimum pipe size is 1/2" for all piping systems.
  - 4. Accurately cut pipe and work into place without springing or forcing, except when cold springing is required.
  - 5. Install pipe lines free from traps, air pockets, sags and bends. Arrange water piping for draining at low points and provide vent valve at high points. Drain valves shall be accessible.
  - 6. Wherever changes in size of pipes occur, the changes shall be made with reducing fittings, as the use of bushings will not be permitted.
  - 7. Securely fasten all piping and equipment in the building to the building construction. Secure branch piping runouts in partitions to steel partition members with tie wire. Provide pipe taping separation between steel and copper.
  - 8. Make branch takeoffs with reducing tees or with line size tee and reducers, except that branches less than half diameter of main may be made with forged branch welding outlet fittings.

9. Piping in any partitions, through plates, studs, etc. shall have sufficient clearance from structure to allow for expansion, contraction of piping. No bare piping should touch wood, concrete, etc., any time.
10. All pipes piercing roof membranes shall be flashed water-tight. Hot pipes shall be fitted with a welded cowl with air space between cowl and flashed curb to allow for any expansion.
11. Provide all piping passing through finished floors, ceilings, partitions, or walls exposed to view with chromium-plated escutcheons in bathrooms, prime coated elsewhere. Fit escutcheons for insulated pipe over insulation.
12. Pipe penetrations at Fire and Smoke rated walls and floors: As specified under SECTION 220100: GENERAL REQUIREMENTS.
13. Pipe penetrations of exterior foundation walls or slabs on grade are to be sealed using Thunderline Link Seal, Calpico, or equal.
14. Cut copper tubing with copper tube cutters, ream and size with sizing tools, and thoroughly clean before application of flux or solder.
15. Tees may be cut into 2-inch and larger copper tubing using Bonney, Brazoletts or equal or by using Tubemaster Tee Turner, T-Drill, or equal.
16. Copper to Steel Connections:
  - a. Make all copper pipe connections to ferrous piping in domestic water systems with Clearflow, Watts, or equal, dielectric waterway or isolation flanges. Dielectric unions not acceptable.
  - b. All uninsulated copper pipe shall be isolated from supports by means of Stoneman Trisolators or Unistrut Unicushion.
17. Install concrete kick blocks at all turns at underground cast iron or non-metallic lines. Thrust blocks shall have 3 square feet minimum bearing surface against the undisturbed side of the pipe trench.
18. Unless otherwise indicated, drains from all equipment and piping having drain connection, where shown or required, shall be run to the nearest adequately sized clear water waste receptacle.
19. The 90-degree turn nearest to the pump at the suction end of pump shall be five suction pipe diameters minimum distance from the pump's suction inlet. Alternatively, a suction diffuser may be used.
20. Install vacuum breakers at all under-the-rim water connections at fixtures and equipment and at all location required by code or code authority. Locate a minimum of 12-inches above the rim of the fixture or equipment.
21. Unless otherwise shown or specified, strainers, located at pumps, reducing and control valves, or at other line devices or equipment, shall be of full line size. Provide Wye-type strainers ahead of all automatic valves, pumps,

pressure regulating valves and similar devices. Provide basket-type strainers where shown.

- 22. Provide ground joint unions at all regulating valves, steam traps, equipment, and where required in lines 2-inches and smaller. Use flanges in lines 3-inches and larger. 2-1/2-inch valves and equipment may have unions or flanges at the option of the Contractor.
- 23. Open-ended line valves shall be provided with plugs or blind flanges.

B. Piping Joints:

1. Threaded Joints

- a. Pipe threads shall be tapered threads in accordance with ANSI/ASME B31.9 and ANSI B2.1 for IPS threaded work. No screwed pipe joints shall be caulked or screwed up with rope or packing of any kind. Teflon pipe tape may be used where appropriate. When erecting plated, polished, or soft metal piping, friction wrenches shall be used exclusively.

2. Brazed and Soldered Joints:

- a. Brazed joints and soldered joints shall be in accordance with ANSI/ASME B31.9-1982 with preparation, techniques and procedures in accordance with the Copper Tube Handbook publication of the Copper Development Association. Brazing materials shall be as specified in the various Sections of these specifications.
- b. Soldered joints in domestic water systems shall be lead free.

3. Joints in Thermoplastic piping:

- a. Adhesives, cements, and sealers used to join piping components shall be compatible with the materials being joined and shall conform to the applicable ASTM Specifications and as otherwise indicated herein.
- b. Preparation for solvent cemented joints shall be as specified in ASTM B31.9 -1982, Building Services Piping, and Chapter V. Solvent cements for thermoplastics shall conform to the following specifications.
  - (1) Material Specification
  - (2) PVC                    ASTM D2564
  - (3) CPVC                 ASTM F493
  - (4) ABS                    ASTM D2235
- c. Heat Fusion Joints: Joint preparation, technique, and procedures shall be in accordance with ASTM D2657-79 except that butt joints

are not acceptable. Branches shall be made only by the use of molded fittings.

### **3.02 FIELD QUALITY CONTROL**

- A. Brazing and Soldering:
  - 1. Brazing and soldering procedure qualification shall conform to ANSI B31.1. Brazing procedure for joints shall be as outlined in the Copper Tube Handbook published by the Copper Development Association.
  - 2. Soldering, soldering preparation and procedures for joints shall be in accordance with ANSI B31.1 and as outlined in the Copper Tube Handbook published by the Copper Development Association.
- B. Inspection, Examination and Testing of Pipe Joints shall be in accordance with Chapter VI of ANSI/ASME B31.9-1982 and SECTION 230593: TESTS AND BALANCING.

**END OF SECTION**



**SECTION 22 05 23 – VALVES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. The requirements of this SECTION apply to all Work of this DIVISION where applicable. The valves, materials, and methods herein are generally common to the various plumbing systems described in other SECTIONS of this DIVISION. Automatic valves, control valves, backflow preventers and other specialty valves are specified on the drawings or in other SECTIONS of this DIVISION.
- B. Provide valves as specified herein for:
  - 1. Domestic Cold and Hot Water

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. SECTION 220100: GENERAL REQUIREMENTS.
- B. SECTION 223000: PLUMBING SYSTEMS.
- C. Where valves specified in other SECTIONS of DIVISION 22 conflict with requirements of this SECTION, the former shall take precedence.

**1.03 QUALITY ASSURANCE**

- A. Valves and Accessories
  - 1. Supply all valves and all accessories new, free from defects.
  - 2. All items of a given type shall be the product of the same manufacturer.
- B. Product Delivery and Storage: Store valves in a protected area. Keep valves in closed position to protect valve seats.
- C. Reference Standards: (Refer to individual Mechanical SECTIONS for additional standards)
  - 1. American Society for Testing and Materials (ASTM) Publications:
    - a. A 47-77 Malleable-Iron Castings
    - b. A 126 Grey Iron Castings for Valves, Flanges and pipe fittings.
    - c. A 216 Grade WCB Cast Carbon Steel
    - d. A 217 Grade CA15 Cast 11-1/2 -13 Chromium Stainless Steel
    - e. B 61 Cast Steam Bronze Castings

- f. B 62 Composition Bronze or Ounce Metal Castings
- g. B 584 Copper Alloy Bronze Castings

**PART 2 – PRODUCTS**

	Globe Valves	Angle Valves
Stockham	B-13T	B-216
Crane	7 TF	17TF
Nibco	T-211-Y	T-311-Y

	Globe Valves	Angle Valves
Stockham	G-514T	G-515
Nibco	F-718-B	F-818-B

**2.01 DOMESTIC COLD AND HOT WATER**

- A. Valves installed in domestic water systems shall be lead-free, as required by the California Health and Safety Code - Section 116875.
- B. Shut-off or sectional valves 2 inch and smaller shall be:
  - 1. Ball Valves: 600 PSI CWP/WOG, two-piece type, with brass or copper alloy body; chrome plated brass or copper alloy ball; replaceable PTFE ball seat; full or standard port; blowout-proof stem; threaded or solder ends with extended cups.
    - a. Threaded: Nibco T-585-80-LF, or equal by Milwaukee or Watts.
    - b. Soldered: Nibco S-585-80-LF, or equal by Milwaukee or Watts.

**2.02 PRESSURE REDUCING AND TEMPERATURE REGULATING VALVES**

- A. See Schedules, details and diagrams on the Drawings.

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

- A. Installation of Valves:
  - 1. Valve sizes and types shall be as shown on the drawings.

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2. Before installing valves, blow out with compressed air and clean with water or steam.
3. Install valves only in accessible locations. Manually operated valves shall be positioned so that stems are in any suitable angle from horizontal to upright position.

**END OF SECTION**

**SECTION 22 05 93 - TESTS AND BALANCING**

**PART 1 – GENERAL**

**1.01 QUALITY ASSURANCE**

- A. Applicator (Erector) Qualifications:
  - 1. System balancing shall be done by a firm regularly engaged and specializing in the field of air and water balancing. Testing and balancing shall be performed in complete accordance with the National Standards for Total System Balance, as published by the Associated Air Balance Council (AABC). The Contractor must be AABC certified. National Environmental Balancing Bureau (NEBB) Certified contractors may perform test and balance work, provided they furnish the same Performance Guarantee as described on page v of the 2002 AABC National Standards. Contractor shall issue such performance guarantee within 30 days of receiving a contract, or 14 calendar days prior to commencing work, whichever is sooner.
  - 2. The Tests and Balancing firm must have experience in projects in similar type and scope and shall submit a list of names and qualifications of all personnel proposed to do this Work. A detailed description of the procedures and the instrumentation employed shall accompany the personnel list. Only experienced personnel and rational orderly procedures will be accepted.
  - 3. The Tests and Balancing Contractor shall contract directly with the General Contractor and shall not be a sub-contractor to the Mechanical Sub-contractor.
  - 4. The final balance report shall be certified by a registered Professional Engineer. Submit the qualifications of the supervisor and engineering technician for review. Personnel shall have past experience of such nature that qualifies them for balancing of these systems.
- B. The Plumbing sub-contractor shall cooperate with the Balancing sub-contractor in the following manner:
  - 1. Performance of pre-balancing requirements of SECTION 220100: GENERAL REQUIREMENTS.
  - 2. Inform the Tests and Balancing Contractor of any major changes made to plumbing systems during construction.
  - 3. Perform pressure testing of piping systems as specified herein.
- C. Requirements of Regulatory Agencies:
  - 1. California Code of Regulations, Title 24, Part 5, California Plumbing Code

- D. Referenced Standards:
  - 1. AABC - Associated Air Balance Council.
    - a. National Standards for Total System Balance.
  - 2. American Society of Mechanical Engineers.
    - a. ASME/ANSI B31.9 Building Services Piping.
  - 3. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.

## **1.02 SUBMITTALS**

- A. Shop Drawings and Product Data:
  - 1. Submit procedure to be followed for water balancing, including:
    - a. Detailed procedures.
    - b. Agenda for this project.
    - c. Report forms.
    - d. Project performance guarantee.
- B. Test Reports:
  - 1. Submit six copies of the balance report typed in final form.
  - 2. Submit six copies of balancing drawings.
  - 3. Submit a written report as necessary, describing any component, i.e. pump, valve, etc., which does not function properly.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Products and Materials as specified in Part 3 of this Section and related Sections.

## **PART 3 – EXECUTION**

### **3.01 WATER BALANCING**

- A. Study the Specifications and Drawings and prepare schedule to inspect equipment of water systems.

- B. Make field inspection prior to closing in portions of systems to be balanced. Verify that all work, fittings, balancing devices, etc., are properly fabricated and installed as specified or shown and that proper balancing can be done.

**3.02 PREPARATION**

- A. Prepare test and balancing procedures schedule, test record forms and technical information about the water systems necessary to balance Work.

**3.03 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION**

- A. Test and Balance Service:
  - 1. The test and balance services shall be performed upon completion of the water systems and after completion of general operating tests described under Prebalancing Requirements in SECTION 220100: GENERAL REQUIREMENTS, and after the Work specified above.
  - 2. Upon completion of installation of water systems and after completion of prebalancing requirements, complete the balance tests, analysis and balance of the water systems.
  - 3. Recommend adjustments and/or corrections to equipment and water systems necessary for proper balancing and submit to the Architect.
- B. Temperature readings shall be accurate to within 1/2-deg F.
- C. Water flow readings shall be accurate to within 5-percent of specified amount.
- D. Pressure readings shall be accurate to within 1/2-psi for water systems.
- E. Spot Checking: After the Balancing Contractor has submitted his records of final readings and measurements for all systems, the Architect may make spot checks of each system. If spot-check measurements differ materially from those submitted, the Architect will direct that the systems concerned be completely re-balanced in the presence of the Inspector and that new data be submitted. All systems shall be completely balanced and preliminary balance reports shall be submitted no later than the actual date of completion of balancing.
- F. Piping Pressure Test:
  - 1. Plumbing piping shall be tested per Title 24, Part 4, and the following.
  - 2. Building service piping shall be examined and tested in accordance with ASME/ANSI B31.9 and the following.
    - a. Allowance may be made for water added or discharged to maintain pressure loss or gain due to temperature change.
  - 3. Domestic Water Distribution Systems:

- a. Provide a pressure gauge located at the highest point of the system being tested, with a shut-off valve and bleeder valve arranged to check gauge operation.
  - b. The test shall be hydrostatic at 150 psig applied not less than 1-hour prior to examination of all joints for leakage.
  - c. Where a portion of the water piping system is to be concealed before completion, this portion shall be tested separately as specified for the entire system.
  - d. There will be no drop in pressure at the end of four hours with pressurization source disconnected.
4. Drainage, Waste, and Vent:
- a. The water test shall be applied to the system either in its entirety or in sections.
  - b. The piping shall be tightly plugged and submitted to a head of water located at the highest point of the system.
  - c. The water shall be kept for at least 30 minutes before the inspection starts.
  - d. System shall hold water for 4 hours without loss.
5. Sectionalizing:
- a. Parts of the system may be isolated for the purpose of testing.
  - b. Each isolated part shall be specifically identified and certified.
- G. Water Balancing:
1. Balance water flow through individual system components to within 5-percent of design quantities. Assure that all modulating control valves provide full throttling from wide open (design) flows to 100-percent shut-off. Verify control sequences, settings, and operation to all automatic control valves. Final position of balance valves shall be plainly marked after balancing is complete.
  2. The water system shall be properly balanced for the water quantities by utilizing thermometer wells, time-quantity devices, and other line flow-measuring devices hereinafter specified. In closed systems, where no line devices are installed, use a surface pyrometer probe. During this period, all automatic valves shall be in the 100-percent open position.
  3. Where pyrometers are used, surface temperature differentials shall be tabulated between inlet and outlet of heat exchange devices. Pyrometers shall be Alnor Type 4200, scale 0-degrees to 300-deg F., with 2-deg F. graduations and appropriate pipe probe.

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4. Water flow from plumbing fixture outlets shall be balanced for normal quantities by use of stops. Hot water return shall be balanced so that hot water at any fixture is obtained at the desired temperature in not more than 15 seconds.

**END OF SECTION**



**SECTION 22 07 00 – INSULATION**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide complete systems of insulation for piping, water heater flues, and equipment as specified.
- B. The intent of these Specifications is that all hot and chilled equipment, piping and other items noted be insulated. The Contractor shall carefully advise himself of the extent of all the factory insulated packaged equipment where piping and miscellaneous parts will be furnished without insulation. Provide insulation as required for all packaged equipment requiring insulation, whether furnished with equipment or not.
- C. Piping:
  - 1. From 105 degrees F to 140 degrees F: insulate piping and fittings except flanges, unions, and valves.
- D. Non-insulated Piping:
  - 1. Vent, overflow, drain, and relief; except where noted otherwise.
- E. Definitions:
  - 1. Finished Spaces: Habitation or occupancy spaces where surfaces are plastered, paneled, or otherwise treated to provide a pleasing appearance.
  - 2. Unfinished Spaces: Storage or work areas where appearance is not a factor; unexcavated spaces, crawl spaces, etc.
  - 3. Concealed Spaces: Spaces between a ceiling and floor construction above; between double walls or furred-in areas; pipe and duct shafts, etc.
  - 4. Exposed: Open to view inside the building (including interstitial spaces). For example, pipe run through a room, and not covered by other construction, is exposed.
  - 5. Outside or exterior: Open to view beyond the exterior side of walls; above the roof; unexcavated or crawl spaces, above or beneath pier floors; in tunnels or exposed on all sides in trenches connected or not connected to an exterior portion of a building.

**1.02 QUALITY ASSURANCE**

- A. Reference Standards:
  - 1. ASTM American Society for Testing and Materials.

- a. B 209 Aluminum and Aluminum-Alloy Sheet and Plate.
  - b. C 195 Mineral Fiber Thermal Insulating Cement.
  - c. C 449 Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
  - d. C 533 Calcium Silicate Block and Pipe Thermal Insulation.
  - e. C 547 Mineral Fiber Preformed Pipe Insulation.
  - f. C 553 Mineral Fiber Blanket and Felt Insulation (Industrial Type).
  - g. C 612 Mineral Fiber Block and Board Thermal Insulation.
2. CCR California Code of Regulations, Title 24
- a. Part 6, California Energy Code.
  - b. Part 4, California Mechanical Code (CMC).
3. Federal Specifications (Fed. Spec.):
- a. L-P-535E Plastic Sheet (Sheeting): Plastic Strip: Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid.
  - b. L-T-80BTape, Pressure-Sensitive Adhesive (Aluminum-Backed).
  - c. HH-B-100B Barrier Material Vapor (For Pipe, Duct and Equipment Thermal, Insulation).
  - d. HH-I-573B Insulation, Thermal, Flexible Unicellular Sheet and Pipe Covering.
4. UBC Uniform Building Code.
- a. Standard 42-1 Test Method for Surface Burning Characteristics of Building Materials.
5. UL Underwriters Laboratory, Inc.

**1.03 SUBMITTALS**

- A. Product Data:
- 1. Submit manufacturer's data on the following:
    - a. Insulation Materials.
    - b. Jackets and casings.
    - c. Adhesives.
    - d. Fastening Devices.
    - e. Vapor Barriers.

- f. Material Safety Data Sheets (MSDS) shall be submitted for all insulation materials including adhesives, cements and finishing materials.
- g. Proof of California Quality Standards Certification.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. **Manufacturer's Stamp or Label:** Every package or standard container of insulation, jackets, cements, adhesives, and coatings delivered to the project site for use must have the manufacturer's stamp or label attached giving name of manufacturer, brand, and description of material. Insulation packages and containers shall be marked "asbestos-free."
- B. All insulation materials subject to regulation under CCR Title 24, Part 6, shall meet the requirements of Section 123 and 124, and Table 123-A, and shall be so certified. Submit proof of certification.
- C. **Fire Resistance:** Insulation, adhesives, vapor-barrier materials, and other accessories, except as specified herein, shall be noncombustible. Materials shall not have a flame-spread rating more than 25 and a smoke-developed rating not more than 50 in accordance with UBC Standard 42-1, except for flexible unicellular insulation which, in thickness greater than 1/2-inch, may have a smoke-developed rating not to exceed 100.
- D. **Materials Tests:** Test factory-applied materials assembled. Field-applied materials may be tested individually. UL label, or satisfactory certified test report from an approved testing laboratory, will be required to show that fire hazard ratings for materials proposed for use do not exceed those specified. Flame-proofing treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.
- E. **Piping Insulation:**
  - 1. Exterior surface of insulation shall be cleanable, grease resistant, nonflaking and nonpeeling. Pipe insulation shall conform with the referenced publications and the specified temperature ranges and densities in pounds per cubic foot (pcf). Insulation for fittings, flanges, and valves shall be premolded, precut, or job-fabricated insulation of the same thickness and conductivity as used on adjacent piping.
  - 2. **Mineral Fiber:** ASTM C 547, for temperature range of 0 to 850 degrees F., preformed, jacketed, vapor barrier, with double adhesive self-sealing lap. Owens-Corning ASJ/SSL-II, Certain-Teed, or equal.
  - 3. **Flexible unicellular:** Fed. Spec. HH-I-573B, for temperature range from -40 degrees to +180 degrees F.

- a. Use for cold water piping and elsewhere where specified.
  - b. Minimum Density: 5.5 lbs./cu.ft.
  - c. Thermal Conductivity: 0.28 K factor at 75 degree F.
  - d. Rubatex, Armaflex, or equal.
4. Fiberglass Duct Wrap: Fiberglass blanket with foil reinforced kraft (FRK) paper vapor barrier; 250 degrees F. maximum; 0.24 Btu/in/hr/sq.ft./degree F. at 75 degree F. mean temperature with 25% compression. Owens Corning Type ASW with FRK facing; Certain-Teed or equal.
  5. Flexible Mineral Fiber Blanket: ASTM C 553, Type I (flexible resilient), up to 1000 degrees F, 0.28 Btu/in/hr/sq.ft./degree F. at 100 degree F. mean temperature. Owens Corning TIW Type I; Certain-Teed or equal.
  6. Rigid Mineral Fiber: ASTM C 612, board type, to 450 degrees F, 3 pcf, foil reinforced kraft facing or all-service jacket facing. Owens Corning Type 703 with FRK jacket; Certain-Teed or equal.
  7. Mineral Fiber Block: ASTM C 612, semi rigid, bonded fiberglass fibers, 850 degrees F. maximum; 3.0 pcf; 0.23 Btu/in/hr/sq.ft./degree F. at 75 degree F. mean temperature. Owens Corning Insul-Quick; Certain-Teed or equal.
- F. Insulation Jackets:
1. Vapor Barrier Material: HH-B-100, Type I. Material shall be resistant to flame and moisture penetration and not support mold growth. Provide foil reinforced kraft facing in concealed locations. Provide vapor barrier material all service jacket on insulation in exposed locations with a white surface suitable for painting without sizing. Lamtec 70JASJ or approved equal.
  2. Aluminum Jackets: ASTM B 209, Temper H14, 0.016 inch thick, smooth. Do not use on calcium silicate surfaces or surfaces above 200 degrees F operating temperature. Pabco-Childers Aluminum Roll Jacketing for straight piping and Pabco-Childers Sure-Fit for elbows, or approved equal. Secure in place with Childers Fabstraps, Pabco Pab-Bands, or approved equal.
  3. Weatherproof: Aluminum jacket, ASTM B 209, minimum 0.016-inch thick, moisture barrier adhered to inside face. Fabricate and install jacketing with a continuous modified Pittsburg Z-Lock on the longitudinal seam. Seal each butted section of jacketing with a butt strap containing high temperature sealant and secure with Childers Lock-On, Pabco Z-Lock, or approved equal.
  4. PVC Jackets: (limited to indoor piping only). Fed. Spec. L-P-535, Composition A, Type II, Grade GU. One-piece premolded plastic covers for fittings, flanges, and valves. Zeston, Speedline, or approved equal.

- G. Removable/Reuseable Insulation: Shall be one or two piece design with silicone coated fiberglass cloth liners, minimum of 1/2-inch thick fiberglass insulation, and a weather barrier of teflon coated fiberglass. Sewing thread shall be teflon coated fiberglass. Quilting pins shall be used to prevent shifting of insulation. Covers shall have rain flaps and straps with stainless steel double buckles or Velcro fasteners. Johnson Energy Products, Accessible Products Co., or approved equal.
- H. Adhesives, Sealants, and Compounds: Shall be compatible with materials to which applied and suitable for the service. Shall comply with South Coast Air Quality Management District VOC regulations (SCAQMD Rule #1168, effective date of July 1, 2005, rule amendment date of January 7, 2005).
1. Vapor-seal and Fiberglass Insulation Adhesive: Foster Quick Tack 85-60 or approved equal, ASTM C 916, Type II. U.L. Label. Adhesive shall meet California Dept of Public Health (CDPH) Standard Method Ver. 1.1, 2010 Small Scale Environmental Chamber Test for VOCs. for CA Specification 01350.
  2. Lagging Adhesive: Fosters 30-36 or equal, U.L. Label
  3. Insulation Cement: ASTM C 195, mineral fiber, thermal conductivity 0.85 max. at 200 degrees F mean when tested per ASTM C 177. Fibrex, Pabco, or approved equal.
  4. Vapor Barrier Coating: Fosters Tite-fit 30-35, or approved equal, U.L. Label, (indoor only above 60 degrees F).
  5. Adhesive for Flexible Unicellular insulation: Rubatex R-373, Armstrong 520 or approved equal.
- I. Accessories:
1. Staples: Corrosion resistant outside clinch type. Bostitch, Duo-Fast or approved equal.
  2. Insulation Bands: 3/4-inch wide; 0.018-inch stainless steel or 0.020-inch aluminum. Band-It, Houdaille, or approved equal.
  3. Bands for Metal Jackets: 3/8-inch minimum width; 0.018-inch stainless steel or 0.020-inch aluminum. Pabco-Childers or approved equal.
  4. Wire: Minimum 16-gauge stainless steel or copper-clad annealed steel wire.
  5. Anchor Pins: Anchor pins, clips and speed washers; AGM Industries, Accessible Products, or approved equal.
  6. Glass Cloth and Tape: Childers No. 10, J.P. Stevens Glass-Tex, open weave, white color cloth; Childers VI-CRYL CP 10, Fosters Aquafas, Eco-Mastic 55-50, or approved equal, weatherproof Mastic.

7. Aluminum Foil Backed Pressure Sensitive Adhesive Tape: Fed. Spec. L-T-80, 50 degrees F max. and limited to use on insulation with factory applied jacket with aluminum foil facing. Venture Tape, Compac Corp. or approved equal.
8. Vapor Barrier Material Tape: Fed. Spec. HH-B-100, Type I, pressure sensitive adhesive backed, Lamtec 70JASJ, Ideal Tape Co. or equal.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION/APPLICATION/ERECTOR**

A. General:

1. During the installation and when putting insulated systems into service, the contractor shall observe all instructions, recommendations, and Cautions issued or published by the insulation materials manufacturers.
2. Preparation: Do not apply insulation until surfaces to be covered have been leak tested, have had rust and scale removed, and have been cleaned, dried, and inspected.
3. Application: Insulation shall be clean and dry when installed and kept dry during finish application. Wetted insulation will not be approved for installation. Install materials neatly with smooth and even surfaces with jackets drawn tight and smoothly cemented down on longitudinal and end laps. Scrap pieces shall not be used where a full-length section will fit. All surface finishes shall be extended to protect all surfaces, ends, and raw edges of insulation. Coatings and adhesives shall be applied at the manufacturer's recommended coverage per gallon.
4. Name Plates and Access Plates: Do not insulate name plates or ASME labels. Bevel insulation around name plates and ASME stamps.
5. Calcium Silicate: Do not install on aluminum surfaces.

B. Piping:

1. Provide insulation of thickness specified for the applicable temperature and service in accordance with California Energy Code. Installed insulation thickness shall exceed required code thickness by 10% (minimum).
2. Pipe Insulation (Except Flexible Unicellular): Install with joints tightly butted. Overlap longitudinal jacket laps not less than 1-1/2 inches. Wrap butt joints with 3-inch wide strips of the same material as jacket. Cement jacket laps and butt strips with adhesive or bedding compound and joint sealer and additionally secure with flared staples on 4-inch centers outside clinched without complete penetration of insulation. A factory applied self-sealing system may be used without staples unless fishmouths develop.

3. Where vapor barrier jacket on piping with liquid of less than 60 deg F is stapled or punctured, the jacket shall be brush coated with vapor barrier coating. Adhesive is not required on hot piping jackets when staples are used.
4. Finish for Outdoor Locations: Weatherproof aluminum jacket.
5. Flanges, Unions, Valves, and Fittings: Except where Flexible Unicellular is applied, use pre-molded, pre-cut, or job fabricated insulation of the same thickness and conductivity as used on adjacent piping. Provide fittings with one-piece insulation covers. When segments of insulation are used, provide elbows with not less than three segments. For other fittings and valves, cut segments to required curvature. Place and join the segments of the insulation with adhesive. After the segments are in place, apply vapor barrier coating. Cover unions and flanges with removable sections of insulation vapor barrier sealed inside and out with adjacent insulation ends neatly finished and vapor barrier sealed. Where unions, flanges, and valves are specified not to be insulated, terminate the covering neatly at the ends with insulation cement trowelled on a bevel. Apply a vapor barrier coating to the beveled ends.
6. Provide Removable/Reusable type insulation for strainers, expansion joints, fittings, valves, and accessories requiring servicing or inspection; or insulation removable and replaceable without damage, within two-piece, No. 18-gauge aluminum covers fastened with cadmium-plated bolts and nuts. Removable covers for strainers may be applied to the strainer removal section only.
7. Flexible Unicellular Insulation: Temperature range minus 30 to plus 220 degrees F. Flexible unicellular insulation shall not be used in pipe chases and fire walls, nor penetrate fire walls. Use an adhesive recommended by insulation manufacturer and apply in accordance with manufacturer's published instructions. Bond cuts, butt joints, ends, and longitudinal joints with adhesive. Miter 90-degree turns and elbows, tees, and valve insulation. Vapor seal unicellular insulation to piping in accordance with manufacturer's instructions. Do not apply unicellular insulation in multiple layers.
  - a. All flexible connections in cold water piping shall be insulated with flexible unicellular insulation.

C. Insulation Finish:

1. Provide Fed. Spec. HH-B-100, Type I, vapor barrier covering for piping and ducts. Vapor barrier surfaces shall be suitable for painting.
2. Hot and cold piping:
  - a. Provide Aluminum jacket at all insulated piping located 9' or less above the finished floor in mechanical rooms. Provide PVC jacket at all other insulated piping in mechanical rooms and indoor piping exposed to view.
  - b. Cold Piping, and Equipment:

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- (1) Pipe, Fittings, flanges, elbows, and irregular surfaces shall be insulated the same as hot piping with special care taken to seal all joints including butts to ensure a continuous vapor barrier.

**END OF SECTION**



**SECTION 22 11 00 – PLUMBING PIPE AND PIPE FITTINGS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Work included in this Section: Materials, equipment, fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction for the following systems:
  - 1. Sanitary waste and vent.
  - 2. Domestic water.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 22 30 00 Plumbing Systems

**1.03 APPLICABLE PUBLICATIONS: THE PUBLICATIONS LISTED BELOW FORM A PART OF THIS SPECIFICATION TO THE EXTENT REFERENCED. THE PUBLICATIONS ARE REFERRED TO IN THE TEXT BY THE BASIC DESIGNATION ONLY.**

- A. American National Standards Institute (ANSI) Publications:
  - 1. B16.5 Steel Pipe Flanges, Flanged Valves, and Fittings
  - 2. B16.9 Factory Made Wrought Steel Butt Welding Fittings
  - 3. B16.11 Forged Steel Fittings, Socket Welding and Threaded
  - 4. B16.12 Cast Iron Threaded Drainage Fitting
  - 5. B16.18 Cast Bronze Solder Joint Pressure Fittings
  - 6. B16.21 Nonmetallic Gaskets for Pipe Flanges
  - 7. B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
  - 8. B16.3 Malleable Iron Screwed Fittings
  - 9. B18.2.1 Square and Hex bolts and Screws, including Hex Cap Screws and Lag Screws
  - 10. B18.2.2 Square and Hex Nuts
  - 11. B31.1 Power Piping
  - 12. B31.9 Building Service Piping
  - 13. B40.1 Gages, Pressure, Indicating Dial Type, Elastic Element
- B. American Society for Testing and Materials (ASTM) Publications:

1. A 47 Malleable Iron Castings
  2. A 53 Pipe, Steel, Black and Seamless Steel Pipe
  3. A 74-82 Cast-Iron Soil Pipe and Fittings
  4. A 183 Carbon Steel Track Bolts and Nuts
  5. A 307 Carbon Steel External and Internally Threaded Standard Fasteners
  6. A 123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  7. A125-96(2001) Standard Specification for Steel Springs, Helical, Heat-Treated
  8. A 536 Ductile Iron Castings
  9. B 32 Solder Metal
  10. B 88 Seamless Copper Water Tube
  11. C 564 Rubber Gaskets for Cast-Iron Soil Pipe and Fittings
- C. American Society of Mechanical Engineers (ASME) Publications:
1. ASME Boiler and Pressure Vessel Code and Interpretations
  2. Section VIII - Pressure Vessels - Division 1
- D. American Welding Society Inc. (AWS) Publication:
1. A5.8-76 Brazing Filler Material
- E. Copper Development Association Inc. Publication:
1. Copper Tube Handbook
- F. Underwriters Laboratories Inc. (UL).
- G. Cast Iron Soil Pipe Institute Publications 301-78 and 310-78.
- H. National Bureau of Standards Voluntary Product Standard PS15.

**1.04 QUALITY ASSURANCE**

- A. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.
- B. Supply all equipment and accessories new and free from defects.

- C. Supply all equipment and accessories in compliance with the applicable standards listed in article 1.03 of this section and with all applicable national, state and local codes.
- D. All items of given type shall be the products of the same manufacturer.
- E. Welding materials and labor to conform to ASME code and applicable state Labor Regulations.
- F. Use fully qualified welders licensed by state authorities.
- G. Each length of pipe, fitting, trap, fixture or device used in any piping system shall be stamped or indelibly marked with:
  - 1. Weight or quality.
  - 2. Maker's name or mark.

**1.05 SUBMITTALS**

- A. Manufacturer's Literature and Data
  - 1. Piping and Fittings, Gaskets, Brazing and Soldering Metals, Piping Accessories, Shop Drawings and Catalog Cuts: Submit shop drawings and catalog information showing plan, elevations, dimensions, capacities.

**PART 2 – PRODUCTS**

**2.01 CLASSES AND MAXIMUM WORKING PRESSURES:**

- A. Equipment and piping components shall be suitable for use under the maximum working pressures indicated. Except as modified herein, the pressure and temperature limitations shall be as specified in the referenced standards and specifications.

**2.02 MATERIALS FOR PLUMBING PIPING**

- A. Equipment Drains and Overflow, Atmospheric Vent, Make-up Water
  - 1. Copper Type L, ASTM B88
- B. Drainage Systems
  - 1. Aboveground (inside building)
    - a. Sanitary waste and vent
      - (1) Hubless Cast Iron to CISPI 301
      - (2) Type DWV, hard temper, ASTM B-306

- b. Storm water
  - (1) Hubless Cast Iron to CISPI 301
- 2. Sanitary piping to meet requirements of National Sanitation Foundation standard 14.
- C. Domestic Water Piping
  - 1. Inside, above ground
    - a. Type L hard copper ASTM B 88
  - 2. Exposed at plumbing fixtures and all kitchen, fixtures and equipment
    - a. Chrome plated brass pipe

**2.03 REQUIREMENTS FOR PIPING AND FITTINGS**

- A. Pressure Piping
  - 1. Pressure piping shall be:
    - a. Ferrous and copper piping conform to requirements of ANSI Safety Code for Pressure Piping, B31.1.
    - b. Be commercially round and straight.
    - c. Be of uniform quality and workmanship.
    - d. Be free from all defects.
    - e. Be identified.
  - 2. Pressure ratings herein are "W.O.G." or "Water Working Pressure."
  - 3. Black Steel, Welded: Schedule 40, ASTM A-234.
    - a. 2-1/2" and larger.
    - b. Steel welding fittings, ANSI B16.9. Shaped nipples and saddles not permitted.
    - c. Steel welding-neck flanges and flanged fittings, ANSI B16.5, 150 psi.
  - 4. Black Steel, grooved end, ASTM A-53 1-1/4" and larger, grooved end fittings as hereinafter specified.
    - a. Roll-grooved - Schedule 40
    - b. Schedule 10 pipe shall not be used.
  - 5. Copper Tubing:
    - a. ANSI H23.1.

- b. Wrought-copper, solder joint fittings, ANSI B16.22, in sizes available.
  - c. Cast-bronze solder-joint fittings, ANSI B16.18, only in sizes not available in wrought copper.
  - d. Cast bronze, threaded, ground-joint unions, ANSI B16.18, 2" and smaller.
  - e. Cast-bronze, flanged unions, ANSI B16.24, 150 psi class, 2-1/2" and larger.
  - f. Copper tubing flared fittings: bronze castings for flared type joints, ANSI B-16.26.
6. Brass:
- a. Standard weight and red brass pipe, 85 percent copper, 15 percent zinc, ANSI H27.1.
  - b. 125 psi threaded brass fittings, ANSI B16.15
7. PVDF (Polyvinylidene fluoride) Piping
- a. De-ionized water piping, all sizes, natural, unpigmented PVDF schedule 80 with schedule 80 socket or butt fusion fittings.
  - b. Piping shall be supported continuously on angle channel support between hangers.
8. Grooved end piping
- a. Couplings of painted malleable iron to ASTM A47 or ductile iron to ASTM A536.
  - b. Gaskets to be product of coupling manufacturer.
  - c. Gaskets to be elastomer conforming to ASTM D2000 EDPM to 200 degree F water.
- B. Drainage Piping:
- 1. Cast Iron pipe: hubless joints to Factory Mutual Standard 1680, Class 1 as required below.
    - a. FM 1680 Class 1 (Clamp-All or Anaco Husky) for waste piping above and below grade and vent piping below grade, stainless steel clamp for vent piping above grade.
  - 2. Copper Tubing:
    - a. Type DWV:
      - (1) Cast-bronze, solder-joint drainage fittings. ANSI B-16.23 or wrought copper ANSI B16.29.

- C. Fittings shall be long radius fittings, except fittings in vent piping may be short radius fittings. Minimum Size piping shall be 2 inches for buried piping and 1.5 inches for aboveground piping.
- D. Pipe Threads: ANSI B1.20.1.
- E. Flange Gaskets:
  - 1. Full faced or flat ring type to suit flange facings, selected from one of following materials:
    - a. Steel Piping Systems:
      - (1) Full face fluorinated elastomer.
      - (2) 1/16" thick.
    - b. Domestic Hot and Cold Water:
      - (1) Red rubber, ASTM D1330.
      - (2) 1/16" thick.
      - (3) Similar to Crane Style 555. Garlock 3000.
    - c. PVDF Piping Systems: EDPM
  - 2. Gaskets coated with thread lubricant when being installed.
- F. Flange Bolts, Nuts and Washers:
  - 1. Plastic piping systems, pultruded FRP, ASTM D638 or 316 stainless steel.
  - 2. Steel piping, carbon steel conforming to ASTM A307, grade B, and material for nuts shall conform to ASTM A194, grade 2. Dimensions of bolts, studs, and nuts shall conform to ANSI B18.2.1 and ANSI B18.3.2 with threads conforming to ANSI B1.1 coarse type with class 2A fit for bolts and studs, and class 2B fit for nuts.
  - 3. Copper piping systems, bronze bolts.
- G. Unions:
  - 1. Steel piping 2-1/2" and smaller (wog):
    - a. Class 150, 250 psig wog.
    - b. Ground joint.
    - c. Anvil International Figure 463, or similar by Grinnell or Watts.
  - 2. Steel piping 2-1/2" and smaller (steam):
    - a. Class 250, 500 psig (wog).

- b. Ground joint.
      - c. Anvil International Figure 554, or similar by Grinnell or Watts.
    - 3. Steel piping larger than 2-1/2": welding flanges.
    - 4. Copper Piping:
      - a. Similar to Nibco No. 733.
    - 5. Other systems to match piping.
  - H. Dielectric flanges, waterways, and couplings.
    - 1. 2-1/2" and smaller:
      - a. 250 psi WOG conforming to ASTM F-492-77
      - b. Threaded ends, electro-zinc plated steel body with thermoplastic liner.
      - c. Similar to Victaulic "Clearflow".
    - 2. 3" and larger:
      - a. Flanged, 175 psi WOG. ANSI B16.42 (iron) and B16.24 (bronze).
      - b. Similar to Watts 3110. EPCO Model X.
    - 3. Dielectric unions shall not be used.

#### **2.04 ESCUTCHEONS, FLASHINGS AND SLEEVES**

- A. Escutcheons:
  - 1. Similar to Grinnell Fig. 2 for copper tubing.
  - 2. Similar to Grinnell Fig. 13 for steel pipe.
  - 3. Brushed chrome plated brass.
- B. Flashings for pipes through roofs:
  - 1. See Architectural drawings.
  - 2. Secure pipe below roof to prevent relative movement.
- C. Sleeves; of following types as required:
  - 1. Minimum 22 gauge, galvanized steel sleeves if removed entirely after concrete pour, Schedule 40 PVC if remaining after pour.
  - 2. With welded PVC flange to serve as water stop in waterproofed walls.

#### **2.05 SHOCK ABSORBERS**

- A. For Copper Piping:

1. Brass body, with diaphragm or piston, pre-charged similar to Watts Series 15, "or approved equal".
2. In domestic water system, bearing National Sanitation Foundation Seal.

## **2.06 FLEXIBLE COUPLINGS**

- A. Provide flexible couplings at pump suctions and discharges. Use molded spherical or convoluted rubber couplings at flanged pump and braided hose at screwed pump connections.
- B. Molded-rubber covered, "Twin Sphere" type design, multi-layered cord fabric design suitable for working pressures ranging from negative ten psi to positive 50psi on continuous basis. Backing rings and other flange plates shall be of galvanized steel. For unrestrained applications provide stainless steel wire restraints.
- C. Metal Flexible Connectors: Provide flexible connectors fabricated of Grade E phosphor bronze, monel or corrugated stainless steel tube covered with comparable bronze or stainless steel braid restraining and pressure cover. Stainless steel grade shall be 304. Live lengths shall be as indicated, but not less than that recommended by the manufacturer for continuous vibration application.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Arrangement:
  1. piping is diagrammatically indicated. Install generally as shown.
  2. Do not scale Drawings for exact location of piping.
  3. Install piping to coordinate with other trades and accommodate field conditions.
  4. Piping arrangement unless otherwise noted:
    - a. Arrange piping neatly along walls.
    - b. In neat, horizontal groups.
    - c. Each group to be in one plane, in so far as possible.
    - d. Piping connections to equipment shall be arranged so that removal of equipment or components of equipment including tube withdrawal from hot water generators, heat exchangers, pump casing, shaft seals and similar work can be accomplished with the least amount of disassembly or removal of the piping system. Piping connected to equipment with vibration isolators shall be provided with flexible



connections conforming to vibration and sound isolation requirements of other Sections of this Division.

5. Do not sleeve structural members without consent of Architect.
  6. Maintain minimum 1" clearance from adjacent work, including insulation, except as noted or approved.
  7. Install piping concealed above ceilings or in walls unless otherwise indicated.
  8. All steel pipe and fittings not insulated or wrapped to be cleaned.
- B. Expansion, Contraction and Bending:
1. Install piping with provisions for expansion and contraction.
    - a. Provide expansion loops, offsets, swing joints, and/or expansion joints where indicated or otherwise required. Nesting of grooved joint couplings for expansion provision not permitted.
  2. Do not spring or force piping during installation.
  3. Do not bend piping without use of pipe bending machine.
- C. Sloping, Air Venting and Draining:
1. Sanitary Drainage Piping:
    - a. Slope horizontal sanitary drainage piping 1/4" per foot minimum, unless shown otherwise or approved by Owner.
    - b. Slope horizontal rainwater drainage piping 1/8" per foot minimum, unless shown otherwise or approved by Owner.
    - c. Make all changes in direction of drainage piping by use of 45-degree wyes, long turn tee wyes, long sweep quarter bends, sixth, eighth or sixteenth bends.
    - d. Short-turn sanitary tees permissible on horizontal to vertical where space conditions require.
  2. Provide drain valves and hose adaptors at all low points in piping on Domestic systems, other systems provide drain valves and hose adaptors at system low point and at equipment connections.
- D. Copper:
1. Crimping of copper tubing, piping or fittings is prohibited.
  2. Isolate copper pipe and tubing from contact with steel.
  3. For branch drops and rises to plumbing fixtures, anchor branch to wall with drop-ear ell or tee.

4. On exposed piping wipe clean all solder joints.
- E. Care of Floors:
1. Do not set pipe vises or threading machines on any unprotected concrete floors.
  2. Cover floor when making plumbing connections to avoid staining floors with oil, white or red lead or other substances.
  3. Contractor shall bear cost of removing any stains.

### **3.02 SYSTEMS INSTALLATION**

- A. Domestic Water:
1. Connect copper tubing to fixtures with hard brass fittings.
  2. Chrome plated where exposed at fixtures.
    - a. Prevent damage to chrome-plated surfaces.
- B. Waste and Vent
1. Provide accessible cleanouts - see Section 22 30 00 Plumbing Systems
- C. Soldered and Brazed Joints:
1. Use 95-5, tin-antimony for domestic water, solder for other copper piping. Use flux meeting ASTM B813 requirements. Assemble solder joints in accordance with ASTM B828.
  2. Brazing filler material BCuP-3 or BCuP-4 to AWS A5.8 during brazing of the pipe connections, the interior of the pipe shall be purged continuously with dry nitrogen. Use a flow meter and regulator to control flow rates.
  3. Clean surfaces to be jointed, of oil, grease, rust and oxides.
    - a. Remove grease form fittings by washing in solution of 1/16 sodium carbonate and three gallons hot water.
    - b. Clean socket of fitting and end of pipe thoroughly with emery cloth to remove rust and oxides.

### **3.03 ADJUSTMENT AND CLEANING**

- A. General:
1. During construction:
    - a. Keep openings in piping closed to prevent entrance of foreign matter.
    - b. Clean pipe, fittings and valves internally.

- c. Hammer welds to remove slag and weld beads.

**3.04 DISINFECTION OF WATER SYSTEMS:**

- A. After domestic water systems have been installed and tested, all piping shall be sterilized by the following method:
  - 1. Inject a solution of chlorine gas and water containing not less than 50-ppm of free chlorine into the system, in such a manner as to ensure that the entire system is completely filled with the solution. During this procedure all valves shall be operated and outlets shall be tested for residual chlorine. Continue injection until all outlets indicate at least 50-ppm of free chlorine.
  - 2. After injection, isolate the system and hold solution in retention, for a period of not less than 24-hours. Make tests for residual chlorine after retention. If such tests indicate less than 50-ppm of residual chlorine, repeat the entire procedure. After satisfactory sterilization has been effected, flush the system with water from any acceptable source, until all traces of chlorine have been removed or until the chlorine content is not greater than that in the existing supply.
- B. Until sterilization of the water system has been made, the Contractor shall maintain signs at all outlet locations stating that the water system has not been sterilized and the water shall not be used for human consumption.
- C. Prior to filing of Notice of Completion, submit a certificate of sterilization/chlorination, together with bacteriological reports, stating the work has been done in accordance with the requirements set forth above.

**3.05 FIELD QUALITY CONTROL**

- A. General Tests:
  - 1. Refer to Section 22 05 93 Tests and Balancing
  - 2. Less than 100 psi operating pressure & vacuum lines.
    - a. Test hydrostatically to 150 psi.
  - 3. Over 100 psi operating pressure:
    - a. Test hydrostatically to 1-1/2 times operating pressure.
    - b. Never exceed test pressure ANSI B16.1 basis.
  - 4. Duration: 2 hours.
    - a. With system valves capped and pressure apparatus disconnected.
      - (1) Pressure change: none
      - (2) Compensate for temperature change.

5. Leaks and defects:
  - a. Repair or replace as directed.
  - b. Without additional cost.
6. Test concealed piping prior to concealment.
7. Refer to other section for tests to plumbing systems and other special piping systems.
8. Notify Architect and Owners inspector in writing one week before test.
9. Furnish written report and certification that tests have been satisfactorily completed.
10. It is the Contractor's responsibility to plan for the testing procedure and to provide all necessary plugs, flanges and fittings, or to temporarily cap pipes to perform the tests.

**END OF SECTION**

**SECTION 22 30 00 – PLUMBING SYSTEMS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide:
  - 1. Sanitary waste and vent systems.
  - 2. Domestic cold and hot water systems.
  - 3. Plumbing and drainage fixtures and trim.
  - 4. Connect to existing systems where shown.
  
- B. Plumbing systems including fixtures, equipment, materials, installation, and workmanship shall be as described herein and as required by applicable codes. Piping shall include all water, sanitary, and drainage piping buried and above ground from the building to five (5) feet outside of the building walls, unless otherwise shown on the drawings. Buried piping includes piping up to but not more than 6 inches above ground or floor slab on grade.
  - 1. The work also includes providing roughing in and making final plumbing connections to equipment furnished under other sections of this specification. See Equipment Connection Schedule on the drawings.

**1.02 RELATED WORK SPECIFIED ELSEWHERE:**

- A. SECTION 210100: GENERAL REQUIREMENTS.
- B. SECTION 210500: BASIC MATERIALS AND METHODS.
- C. SECTION 210523: VALVES.
- D. SECTION 220548: NOISE, VIBRATION AND SEISMIC CONTROL.
- E. SECTION 220593: TESTS AND BALANCING.
- F. SECTION 221100: PLUMBING PIPE AND PIPE FITTINGS.

**1.03 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies: All Work in accordance with the California Plumbing Code and local codes.
- B. Applicator (Erector) Qualifications:
  - 1. Sterilization shall be accomplished by a firm which is thoroughly familiar with statutes and procedures required by regulatory bodies in the area, possesses

the necessary sterilization/chlorination equipment, and has chemical laboratory facilities capable of rendering bacteriological examinations and reports.

2. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture. Supply all equipment and accessories new, free from defects. All items of a given type shall be the product of the same manufacturer.
- C. In all cases where FS, CS, ANSI, NSF, or other standards are shown specified or required, products shall meet or exceed the standards established for material, quality, manufacture, and performance.
- D. As required by the California Health and Safety Code Section 116875, all piping, fittings, and fixture faucets intended to convey or dispense water for human consumption through drinking or cooking shall be lead free, except for main gate valves 2" and larger. "Lead free" shall mean not more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent when used with respect to the wetted surfaces of pipes and pipe fittings, and plumbing fittings and fixtures. All pipe, pipe or plumbing fittings or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.
- E. Referenced Standards:
1. California Health and Safety Code Section 116875 (Lead-Free Products)
  2. ANSI American National Standards Institute.
  3. ASSE American Society of Sanitary Engineers.
  4. CCR California Code of Regulations, Title 24, Building Standards Code
  5. CS Commercial Standards, Commodity Standards Division, U.S. Department of Commerce.
  6. FM Factory Mutual System
  7. FS Federal Supply Service, Standards Division, General Services Administration.
  8. IAPMO International Association of Plumbing and Mechanical Officials.
  9. NSF National Sanitation Foundation.
- F. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Unless otherwise indicated the latest issue shall apply.

1. American National Standards Institute (ANSI) Publications:
  - a. A112.6.1M Supports for Off-the-Floor Plumbing Fixtures for Public Use
  - b. A112.19.1M Enameled Cast Iron Plumbing Fixtures
  - c. A112.19.2M Vitreous China Plumbing Fixtures
  - d. A112.19.4M Porcelain Enameled Formed Steel Plumbing Fixtures
  - e. A112.19.5 Trim for Water-Closet Bowls, Tanks, and Urinals
  - f. A112.21.1M Floor Drains
  - g. A112.21.2M Roof Drains
  - h. A112.36.2M Metallic Cleanouts
  - i. B16.1-89 Cast-iron Pipe Flanges and Flanged Fittings
  - j. B16.3-92 Malleable Iron Threaded Fittings
  - k. B16.12-91 Cast-iron Threaded Drainage Fittings
  - l. B16.18-84 Cast Copper Alloy Solder Joint Pressure Fittings
  - m. B16.22-95 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
  - n. B16.39-86 Malleable Iron Threaded Pipe Unions
  - o. B40.1-2000 Gages, Pressure, Indicating Dial Type, Elastic Element
2. American Society for Testing and Materials (ASTM) Publications:
  - a. A 47/47M-99 Malleable Iron Castings
  - b. A 53/53M-02 Pipe, Steel, Black and Hot Dipped, Zinc Coated Welded and Seamless
  - c. A 74-03b Cast-iron Soil Pipe and Fittings
  - d. A 121-99 Pipe, Steel, Black and Hot Dipped Zinc Coated (Galvanized) Welded and Seamless for Ordinary Uses
  - e. A 183-03 Carbon Steel Track Bolts and Nuts
  - f. A 536-84 Ductile Iron Castings
  - g. B 32-03 Solder Metal
  - h. B 88-02 Seamless Copper Water Tube

- i. C 564-03 Rubber Gaskets for Cast-iron Soil Pipe and Fittings
- 3. American Society of Sanitary Engineers (ASSE) Publications:
  - a. 1010-98 Water Hammer Arrestors
- 4. American Water Works Association (AWWA) Publications:
  - a. C651-99 Disinfecting Water Mains
- 5. Cast-iron Soil Pipe Institute (CISPI) Publications:
  - a. 301-97 Cast-iron Soil Pipe and Fittings for Hubless Cast-iron Sanitary System
  - b. 310-97 Patented Joint for use in Connection with Hubless Cast-iron Sanitary System

#### **1.04 SUBMITTALS**

- A. Shop Drawings and Product Data:
  - 1. Descriptive Data:
    - a. Plumbing fixtures.
    - b. Plumbing supply fixtures.
    - c. Pipe and fittings
    - d. Drains
    - e. Fixture supports.
  - 2. Certificate of Sterilization/Chlorination of Domestic Water System.

### **PART 2 – PRODUCTS**

#### **2.01 MATERIALS**

- A. Drains: Zurn, Smith or Josam, as shown and scheduled.
- B. Cleanouts: Zurn, J.R. Smith, or Josam.
- C. Flush Valves: Zurn, Sloan or equal.
- D. Seats: Olsonite, American Standard, Kohler, Church or Beneke.
- E. Supplies: BrassCraft, Proflo, Chicago, or equal.
- F. Stops: BrassCraft, Proflo, Chicago, or equal.



- G. Fixture Traps: IAPMO or CSA listed. TWI, McGuire, or equal.
- H. Fixture Supports: Zurn, J.R. Smith, or equal, or as Scheduled.
- I. "P" Traps:
  - 1. Cast Iron: AB&I, Tyler, or equal.
  - 2. Each trap shall be self-cleaning. Where cast iron traps are not used, traps shall be 17 gauge cast brass. Each trap shall have the manufacturer's name and gauge of the tubing stamped legibly in the metal of the trap. Every trap shall have a smooth and uniform interior waterway.
  - 3. The traps manufacturer shall be able to demonstrate to the Authority Having Jurisdiction that it meets these requirements as well as any other pertinent requirements of Chapter 10 of the California Plumbing Code.
- J. Fixtures:
  - 1. Fixtures and trim shall be complete for proper installation as described in the manufacturer's catalog with the modifications as indicated on the Plumbing Fixture Schedule.
  - 2. All fixtures, specified to be of vitreous ware, shall be fired vitreous chinaware of the best quality, non-absorbent and burned so that the whole mass is thoroughly fused and vitrified producing a material white in color, which when fractured will show a homogeneous mass, close-grained and free from pores. The glazed and vitreous china fixtures shall be white, thoroughly fused and united to the body, without discoloration, chips, or flaws and shall be free from cracks. Warped or otherwise imperfect fixtures will not be acceptable.
  - 3. Unless otherwise specified, water closets shall have a waste passage to pass a 2-1/2 inch ball minimum.
  - 4. Unless otherwise specified, enameled ware shall be white cast iron with acid-resisting enamel.
  - 5. Fixtures shall be free from imperfections, true as to line, angles, curves, and color; smooth, watertight, and practically noiseless in operation.
  - 6. Fixture trim and exposed metal items including piping shall be polished chrome-plated, unless otherwise noted, and pipes passing through walls have polished chrome-plated escutcheon plates.
  - 7. Provide fixtures with:
    - a. Faucets with renewable seats or replaceable internal units.
    - b. Composition washers.
- K. Refer to other Sections of this Division for:

1. Dielectric Unions, couplings or flanges.
  2. Pipe Sleeves.
  3. Escutcheons.
- L. Piping Isolators: Stoneman Engineering Trisolators, Unistrut Unicushion, or equal.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION**

- A. Refer to other Sections of this Division for trenching and backfill:
- B. Sanitary Drainage Piping:
1. Slope horizontal sanitary drainage piping 1/4-inch per foot minimum.
  2. Make all changes in direction of drainage piping by use of 45-degree wyes, long turn tee wyes, long sweep quarter bends, sixth, eighth or sixteenth bends.
  3. Short-turn sanitary tees permissible on horizontal to vertical where space conditions require.
- C. Installation of Cleanouts:
1. General: Install cleanouts where required by local code or code authority and where shown. Install cleanouts in accessible locations and in no case more than 50-feet apart. Provide threaded bronze or thermoplastic cleanout plugs; install with teflon thread tape.
  2. Floor Cleanouts: Provide cast-iron floor cleanout with [anchor] flange, polished bronze or nickel bronze rim and scoriated floor plate with CO cast in the plate. Secure floor plate with countersunk screws for installation flush with finished floor.
  3. Wall Cleanouts: Provide polished stainless steel or chromium- plated bronze frame and cover plate.
  4. Cleanouts Exterior to Buildings:
    - a. Provide cast-iron cleanouts and countersunk plugs.
    - b. Provide cast-iron cleanout box with cover.
    - c. Provide 24- by 24- by 4-inch thick concrete slab with top 1.0 inch above grade with cleanout located in center of slab.
      - (1) Slope top of concrete down to edges.
      - (2) 45-degree bevel top corner edges.

- D. Domestic Water:
  - 1. Piping:
    - a. Free of traps.
    - b. Grade piping and provide valves for complete control and drainage of system with drain cocks at low points and base of risers.
    - c. Avoid dead legs. Where not possible, dead legs shall be no longer than three pipe diameters.
- E. Plumbing and Drainage Fixtures:
  - 1. Prevention of Water Contamination: Water-supply connections to plumbing fixtures and equipment shall be over-rim or protected by vacuum breakers and/or check valves or backflow preventers as indicated or required. All hose connections shall be so protected.
  - 2. Connections to equipment:
    - a. Flanges or unions.
    - b. Threaded adaptors used for swing connections.
    - c. Terminate plugged or capped connections with threaded plug or threaded nipple and cap as required.
  - 3. Install fixtures in accordance with fixture manufacturer's recommendations.
    - a. Set fixtures level and equally spaced when installed in bank of more than two (2).
    - b. Rough-in supplies level, equally spaced and symmetrical with the fixture.
    - c. Rough-in wastes in alignment with the fixture drain. Offsetting trap and waste will not be acceptable, unless specifically approved in writing on a case-by-case basis by the Architect. Install flush valves level with flush connections vertically. Offsetting and misalignment will not be acceptable.
    - d. Caulk all deck mounted trim at the time of assembly, including fixture and casework mounted. Caulk all self-rimming sinks installed in casework. The butted space between fixtures and the wall, counter, or floor on which they are mounted shall be sealed with white acrylic plastic compound.
    - e. Exposed fixture fastening nuts and bolts shall be covered with china bolt caps filled with putty.
    - f. Makeup trim with care and with the proper tools in order that no tool marks show after installation.

4. Water Supplies:
  - a. The general layout of piping on the drawings indicates branch runouts terminated at individual or groups of fixtures. The piping shall be considered continuous and finally connected to all fixtures and equipment.
  - b. Each water supply to a fixture, equipment or faucet shall have a stop in the branch connecting thereto. The stop shall be loose key partition stop at finished wall locations and a rough brass globe valve at rough location. Angle stops for deck mounted faucets shall have an IPS inlet.
  - c. At accessible toilets, the flush valve operating handle shall be installed on the side having the largest clearance.
  - d. Provide water hammer arrestors in the supply line to each fixture or group of two or more fixtures using flush valves or quick-acting valves. Unless otherwise indicated, locate and size the shock absorber in accordance with the manufacturer's recommendations and instructions. Install sectional valve upstream of water hammer arrestor, and provide access for replacement.
  - e. Water supplies to other fixtures (except drinking fountains and lavatories faucets with flow rates less than 0.6 GPM) shall be fitted with ANSI /ASSE 1010-2004 listed maintenance-free water hammer arrestor (similar to PPP part number SWA). No access for replacement shall be required.
  - f. Water supplies to fixtures shall be minimum 1/2-inch size.
  - g. Cover unoccupied fixture faucet holes with faucet hole covers.
  - h. Securely fasten screwed adaptor fittings behind water supply stubouts to the structure.
  - i. Fixture trim, faucets and shower heads shall be certified in accordance with CCR Title 24, Section 2-5314.
5. Mounting supports: Unless otherwise shown or scheduled, bracket all wall mounted fixtures to 12-gauge steel plates, fastened to face of steel studs, with metal screws, and with bracket screwed to backing or as otherwise indicated on Architectural drawings.

**3.02 DISINFECTION OF WATER SYSTEMS:**

- A. After domestic water systems have been installed and tested, all piping shall be sterilized by the following method:
  1. Inject a solution of chlorine gas and water containing not less than 50-ppm of free chlorine into the system, in such a manner as to ensure that the entire system is completely filled with the solution. During this procedure all valves

shall be operated and outlets shall be tested for residual chlorine. Continue injection until all outlets indicate at least 50-ppm of free chlorine.

2. After injection, isolate the system and hold solution in retention, for a period of not less than 24-hours. Make tests for residual chlorine after retention. If such tests indicate less than 50-ppm of residual chlorine, repeat the entire procedure. After satisfactory sterilization has been effected, flush the system with water from any acceptable source, until all traces of chlorine have been removed or until the chlorine content is not greater than that in the existing supply.
- B. Until sterilization of the water system has been made, the Contractor shall maintain signs at all outlet locations stating that the water system has not been sterilized and the water shall not be used for human consumption.
  - C. Prior to filing of Notice of Completion, submit a certificate of sterilization/chlorination, together with bacteriological reports, stating the work has been done in accordance with the requirements set forth above.

**END OF SECTION**

## **SECTION 23 01 00 – GENERAL REQUIREMENTS**

### **PART 1 – GENERAL**

#### **1.01 DESCRIPTION**

- A. Comply with the requirements of DIVISION 1.
- B. The requirements of this SECTION apply to all work of this DIVISION.
- C. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment, which is shown or listed, provide an item which will allow the system to function properly at no increase in the Contract Amount.

#### **1.02 QUALITY ASSURANCE**

- A. Related Work Specified Elsewhere:
  - 1. Refer to DIVISION 26 for all electrical wiring (except that specifically indicated on Control Drawings) for motor starters (except pre-wired packaged systems, in which case they must conform to DIVISION 26).
- B. Examination of the Site:
  - 1. Visit the site prior to bidding. Take measurements and such other information as to locations, depths, capacities and sizes of existing piping and ductwork to which connections may be made or which may be abandoned or which require rerouting. If any of the above requires extra work due to discrepancies or omissions on the drawings, and if such omissions or discrepancies have been revealed by examination before bidding, the Contractor should report the discrepancy to the Architect a minimum of three days prior to receipt of bids. If additional work is required due to omissions and discrepancies after the contract for the work is signed and if such omissions or discrepancies would have been revealed by a visit to the site before receipt of bids, then the corrective additional work shall be performed at no additional cost to the Owner.
- C. Requirements of Regulatory Agencies:
  - 1. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the Architect for approval. If an

organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable testing and is approved by the Architect. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard.

2. Any specific reference in these Specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at date of submission of Bid, unless the Document is shown dated.
3. Perform the work in conformance with the applicable requirements of all regulatory agencies, including, but not limited to the following:
  - a. National Electrical Code.
  - b. Uniform Plumbing Code.
  - c. International Building Code
  - d. California Code of Regulations (CCR).
    - (1) Title 8, Division 1, Chapter 3.2 - California Occupational Safety and Health Regulations (CAL/OSHA).
    - (2) Title 8, Division 1, Chapter 4 - Safety Orders.
    - (3) Title 24, Building Standards.
      - (a) Part 2 - California Building Code
      - (b) Part 3 - California Electrical Code
      - (c) Part 4 - California Mechanical Code
      - (d) Part 5 - California Plumbing Code
      - (e) Part 6 - California Energy Code
      - (f) Part 9 - California Fire Code
    - (4) Acceptance Requirements of California Energy Code: Perform work necessary to complete the Acceptance Requirements of the California Energy Code, including but not limited to:
      - (a) Reviewing plans and specifications to ensure conform to the Acceptance Requirements

- (b) Undertake all required Acceptance Requirement procedures and identify all performance deficiencies, ensuring that they are corrected. Document the results of the Acceptance Requirement procedures on the Acceptance Test forms and indicate satisfactory completion by signing the Certificate of Acceptance.
  - 4. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules, regulations.
  - 5. When Drawings or Specifications exceed requirements of applicable laws, ordinances, rules, regulations, Drawings and Specifications take precedence.
  - 6. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.
  - 7. Work herein shall comply with all applicable requirements of CCR Title 8, Division 1, as they apply to this project, both in reference to Contractor's operations in performing his work and also in construction result to be accomplished. Where an omission or a conflict appears between OSHA requirements and the Drawings and Specifications, OSHA requirements shall take precedence.
- D. When there is an ambiguity or discrepancy between Drawings and Specifications the more stringent requirement of the two shall be provided.
- E. Licenses, Permits and Fees
- 1. Provide, procure and pay for all permits, licenses, fees, etc., required to carry on and complete the Mechanical Work. Contact all applicable utility authorities and include in bid all fees, charged by any such authorities.
- F. Operating and Maintenance Instruction:
- 1. Furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man days (8 hours) of instruction furnished shall be 1.

**1.03 SUBMITTALS**

- A. General



1. Submit shop drawings, catalog data, supplemental data, for all materials, equipment in all Sections of this DIVISION and as specified hereinafter.
  2. Four weeks after award of the Contract, or earlier if deemed appropriate by the Architect, submit a schedule of all submittals with the date of each equipment submittal or shop drawing submittal clearly indicated.
  3. Forward all submittals to Architect, together, at one time. Individual or incomplete submittals are not acceptable. Six (6) copies are required. Electronic copies of submittals shall be appropriately bookmarked, annotated and organized, as described below for paper submittals, for clarity so that the submitted items can be easily compared to the corresponding specified item.
  4. Submittals shall have been reviewed and stamped by the General Contractor in accordance with the requirements of the GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION. Submittals not so stamped will be returned without review.
  5. The contractor shall allow for adequate time for submittal review by the engineer. In general, the contractor shall allow for a minimum of 15 working days from the day the general contractor sends the submittal to the architect to the day the architect returns the submittal to the general contractor. Additional time shall be allowed for large or complex submittals.
  6. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
  7. Identify each submittal item by reference to Specification SECTION Paragraph in which item is specified or drawing and detail number.
  8. Organize submittals in same sequence as they appear in specification sections, articles, or paragraphs.
  9. Submit signed Acceptance Test forms indicating completion of California Energy Code Acceptance Test requirements.
- B. Electronic Submittals: Electronic submittals is the preferred method of review. Follow these procedures:
1. Provide one pdf file for each submittal. PDF file must be unlocked, editable and printable to accommodate electronic mark-ups or printing a hard copy from markup.
  2. Electronic submittals are to be complete and self-contained with each item requiring Architect's action highlighted.
  3. Web links or other electronic submittals requiring the Architect to surf websites or navigate to find documents on websites or posting services are not acceptable.

4. The use of construction phase file hosting services or programs such as BIM 360 or Prolog or Primavera may not be used before prior approval from the Architect.
  5. Any electronic submittal procedures should not require the Architect to search for submittals but should follow procedures that are the electronic equivalent of hard copy submittals sent by Contractor to the Architect in a manner acceptable to the Architect including indexing requirements mentioned below.
  6. No electronic submittals for samples (if needed) will be permitted.
  7. Architect will return one marked up electronic submittal for Contractor to process and distribute to subcontractors and for Owner according to agreed procedure.
  8. On each electronic submittal, provide Contractor review and approval stamp.
- C. Indexing:
1. Submittals shall be indexed according to specification DIVISION and SECTION number and paragraph to identify each item. Sporadic submittals, incomplete data, or unidentified data, or data not showing features to coordinate item with other work will not be accepted.
- D. Submittal literature, Drawings and wiring diagrams shall be specifically applicable to this project and shall not contain extraneous material. The literature shall be clearly marked to indicate the proposed item and any accessories or options to be furnished. Submittals shall include, but not be limited to the following:
- a. Hangers and Seismic Bracing, Insulation, Vibration Isolators
  - b. Duct Trim
  - c. Air Inlets and Outlets (with a detailed list including Room Nos., neck sizes, throws and NC levels).
- E. Resubmittals shall respond to comments made on the original submittal and shall be marked with a resubmittal number and dated. Resubmittals not in conformance with these requirements will be returned without review.
- F. Shop Drawings: (Also see Division 1 requirements)
1. Submit shop drawings for piping, ductwork, and equipment. Do not begin fabrication until shop drawings have been coordinated with all trades and have been reviewed and accepted by the Architect.
  2. Contractor shall prepare and submit coordinated shop drawings for our review prior to installation of work. Shop drawings shall show mechanical (including plumbing), electrical, lighting, low-voltage, and fire protection systems including piping, ducting, equipment, devices, fixtures, supports, drains, panels, connections, etc. to show that all equipment/systems can be

constructed without interference between components. Equipment access as required by code or as recommended by the manufacturer shall be accounted for and shown.

3. Drawings shall be a minimum of 8-1/2 inches by 14 inches in size, with a minimum scale of 1/8 inch per foot, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Ductwork and piping layouts and Mechanical Room layouts shall be drawn at a minimum scale of 1/4 inch per foot. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment and devices.
4. Submit wiring diagrams for packaged equipment and controls. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment.
5. The Architect's review of Shop Drawings is not intended to verify dimensions or quantities, nor to coordinate items shown on these Drawings. He will review them for general conformance with design concept of the project and general compliance with the information given in the contract requirements of the plans and Specifications. Contractor is responsible for dimensions, which shall be confirmed and correlated at the job site, for fabrication processes and techniques of construction, for coordination of his work with that of all other trades and the satisfactory performance of his work.

G. Record Drawings

1. Installation drawings shall be drawn at the site by the Contractor on reproducible paper and shall be fully coordinated for interferences by all trades. The Contractor shall maintain at the jobsite a complete set of prints of the installation drawings for all mechanical work. These prints shall be kept up to date by recording all changes daily. The progress of the work shall be clearly, neatly and accurately designated, coloring in the various pipes, ducts and equipments as they are erected. This process shall incorporate all changes to the original drawings including formal change orders or other instructions issued by the Architect. Principal dimensions of all concealed work shall be recorded including height to underside of ducts.
2. These marked up prints will be used as a guide for determining the progress of the work installed. They will be inspected monthly by the Architect and shall be corrected immediately if found either inaccurate or incomplete.
3. Prior to final acceptance of the Work of this Division, submit properly certified Record Drawings to the Architect for review and make changes, corrections, or additions as the Architect may require. After the Architect's review and any

required Contractor revisions, deliver the Record Drawings to the Owner on electronic media in AutoCAD .DWG format. The Architect and Engineer do not assume any responsibility for the accuracy or completeness of the Record Drawings.

- H. Three (3) copies of certification signed by Owner's representative, attesting to their receipt of instructions required by paragraph "Operation and Maintenance Instruction" of this Section.

#### **1.04 PRODUCT DELIVERY AND STORAGE**

- A. Identify materials and equipment delivered to site to permit check against approved materials list, reviewed shop Drawings.
- B. Protect from loss or damage. Replace lost or damaged material and equipment with new at no increase in the Contract Amount.
  - 1. Store material in clean, dry locations. Store material off of floor, and wrap material or otherwise protect from contamination by construction debris, dust, etc. Follow manufacturer's recommendation for storing the material at all times.

#### **1.05 DRAWINGS AND COORDINATION WITH OTHER WORK**

- A. Contract Drawings:
  - 1. For purposes of clarity, legibility, the Contract Drawings are essentially diagrammatic to extent that many offsets, bends, unions, special fittings are not shown. Exact locations of items are not indicated, unless specifically dimensioned.
  - 2. Exact routing of ductwork, etc., shall be governed by structural conditions, obstructions. Contractor shall make use of data in Contract Documents. Architect reserves right, at no increase in price, to make any reasonable change in location of mechanical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility. Verify Architect's requirements in this regard prior to roughing-in.
  - 3. In addition to the Shop Drawings called for under SUBMITTALS the Contractor shall prepare large scale layout drawings showing location of equipment, piping and duct runs, and all other elements of mechanical systems provided under this DIVISION. Include sections of congested areas to show relative position and spacing of affected elements.
  - 4. Provide templates, information, and instructions to other DIVISIONS to properly locate holes and openings to be cut or provided for electrical Work.
  - 5. Not all offsets in ductwork are shown. Decide which item to offset or relocate. Maintain required slope in piping.

- B. Coordination:
  - 1. Work out all "tight" conditions involving Work under this DIVISION and Work in other DIVISIONS in advance of installation.
  - 2. Maintain minimum 1 inch clearance from adjacent work, including piping, ductwork, insulation, etc. except as noted or approved.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two year use shall include applications of equipment and materials under similar circumstances and of similar size.
- B. Alternative Service Record: Products having less than a two-year field service record may be acceptable on approval of the Architect if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.
- C. Service Support: Major equipment items shall be supported by service organizations. The Contractor shall submit a certified list of qualified permanent service organizations for support of the equipment, which includes their addresses and qualifications. These service organizations shall be reasonably convenient to the equipment installation and able to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- D. Identify materials, equipment by manufacturer's name, nameplate data. Remove unidentified materials, equipment from site.
- E. Where no specific make of material or equipment is mentioned, any first class product of reputable manufacturer may be used, provided it conforms to requirements of system and meets acceptance.
- F. Equipment or material damaged during transportation, installation or operation is considered as totally damaged. Replace with new. Variance with this permitted only with written acceptance.
- G. Provide an authorized representative to constantly supervise work of this DIVISION, check all materials prior to installation for conformance with Drawings and Specifications.

- H. Equipment shall be as described in the respective SECTIONS of THIS DIVISION and as shown.

**PART 3 – EXECUTION**

**3.01 DEMOLITION**

- A. Remove all ducts, fixtures, equipment, etc., where shown or otherwise indicated to be removed.

**3.02 INSTALLATION**

- A. Manufacturer's Recommendations
  - 1. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, printed copies of these recommendations shall be furnished prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
  - 2. Provide complete systems in accordance with manufacturers' requirements.
  - 3. Where dimensions or specific installation and operating instructions of equipment are not provided in the Drawings or Specifications, perform the Work according to approved manufacturer's specifications and recommendations. Any material and work required under this heading shall be supplied at no additional cost to the Owner.
  - 4. Assemble equipment which is required to be field assembled, under the direct supervision of the manufacturer's agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- B. Equipment: Accurately set and level with supports neatly placed and properly fastened. Properly fasten equipment in place with bolts to prevent movement in earthquake. No allowance of any kind will be made for failure on part of Contractor to foresee means of bringing in or installing equipment into position inside building.
- C. Ductwork Systems:
  - 1. Worked into complete, integrated arrangement with like elements to make work neat appearing, finished.
  - 2. Run concealed, except as shown or noted otherwise; where exposed, run parallel with walls or structural elements; vertical runs plumb; horizontal runs parallel with structure and level or uniformly pitched as appropriate.
  - 3. Install with adequate passageways free from obstructions, as high as practicable to maintain adequate head room, as shown or as required. Notify

Architect before installation whenever head room of less than 7-feet 6-inches will result. Coordinate with work of other DIVISIONS to achieve proper head room as specified in this DIVISION.

4. Provide bases, piers, metal frames and backings, hangers and supports for the fixtures and systems furnished under this DIVISION.
  5. Expansion and Contraction: Make adequate provisions, whether those provisions are shown on Drawings or not.
  6. Cleaning and Closing: Inspect all ductwork, and equipment before placing; clean interior before closing. Close all ductwork at end of each day's work.
- D. Cutting and Repairing:
1. Do all cutting, repairing, including structural reinforcing, necessary for Work under this DIVISION.
  2. Do no cutting or patching without Architect's review. Repair damage done by this cutting equal to original condition in Architect's opinion.
  3. Assume responsibility for all damage to any part of premises or Work of other DIVISIONS, caused by leaks or breaks in piping or equipment furnished and/or installed under this DIVISION during construction and guarantee period.
- E. Temporary Ventilation:
1. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-2007, or an average efficiency of 30 percent based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy (see additional requirements in Specification Section 234000), or, if the building is occupied during alteration, at the conclusion of construction.

### **3.03 TESTING AND ADJUSTING**

- A. Do not start or operate any equipment until the unit as well as all services connected thereto have been supported and seismically braced. Services connected to equipment includes piping and its in-line components, ductwork and its in-line components, wiring, or other in-line components.
- B. Furnish all labor and test equipment required under this DIVISION and in accordance with SECTION 230593 and as follows.
- C. Clean and purge equipment before each test.

- D. Test various Mechanical systems in portions as work progresses. Any system or portion previously tested shall become part of any repeated test when it becomes part of distribution or collection system.
- E. Repair leaks by remaking with new material. Makeshift leak stopping methods are not acceptable.
- F. Should any piece of equipment or material fail in any of the tests, immediately remove, replace with new; retest system.
- G. Maintain test pressures for periods stated, or as directed without loss in pressure, except that due to change in temperature or atmospheric pressure during test.
- H. Perform all tests in accordance with the requirements and under supervision of authorities having jurisdiction.
- I. Water Prebalancing Requirements:
  - 1. Complete and test all systems early enough to enable completion of air balancing prior to Owner move in.
  - 2. Prior to any demolition or other work performed on the existing supply and return/exhaust air distribution systems, perform the following work on the existing fan systems:
    - a. Measure and record the following parameters for the system fan:
      - 1) RPM
      - 2) Fan Motor Amperage
      - 3) Static pressure upstream and downstream of the fan
      - 4) CFM, by taking a traverse at a convenient location or locations, or other suitable means of measurement.
    - b. Measure and record the air quantities to all areas and/or duct branches outside the work area that are served by fan systems which also serve the work area. This information must be complete enough to achieve the air balance as required by article 3.03 of Section 230593.
    - c. Submit all quantities measured above to the Architect. Do not proceed with demolition or construction until Architect has approved this submittal.
    - d. If the measured quantities differ from the amount shown by more than plus or minus 10-percent, report the discrepancy to the Architect. The Architect will then issue the necessary instructions how to proceed.



3. Complete or perform the following Work prior to commencement of the balancing procedure:
  - a. Testing of all systems.
  - b. Prior to the start of balancing, complete all punch list items that will affect balancing of the system.
  - c. Install all dampers and other balancing devices shown and specified and check to be sure they are properly installed, indexed, and in good working order.
  - d. Schedule the Work of all other trades to eliminate system shutdown for any reason once balancing is started.
  - e. Schedule the Work of other trades to assure uninterrupted access to mechanical equipment rooms as well as conditioned spaces.
  - f. Provide labor and material necessary to perform any system revisions required to allow completion of balancing.
  - g. Set all manual dampers to 100-percent open position.
  - h. Remove all adjustable pitch pulleys from the motor shaft; the shaft and pulley threads shall be cleaned, lightly oiled; and the pulley remounted, aligned, and properly adjusted.
  - i. Drill 3/8-inch diameter holes in low velocity ductwork with burrs removed, for temperature, pressure, and velocity readings; and provide holes in drive guards that will permit tachometer readings without removing guards. Locate as specified hereinafter and as directed. Install a replaceable rubber plug in each hole.
  - j. Clean interior of all plenums, casings, and ducts; and install temporary and final filters before starting any systems.
  - k. Place all systems in automatic operation.
  - l. Notify the Architect prior to start of tests to enable balancing to be scheduled.
4. Drill test holes in the following locations:
  - a. Each side of each filter, fan, coil, and multi-blade damper; 12-inches O.C. for traverse readings in all main ducts and as directed in the field. Provide at least ten (10) extra plugs to the Owner.
5. When all the above testing and adjusting Work has been completed, submit a written statement to the Architect, stating that all the testing and prebalancing requirements have been met. Final Balancing shall not begin until the certificate has been approved by the Architect.

- J. At completion of Work, provide written certification that all systems are functioning properly without defects.

### **3.04 CLEANING AND PAINTING**

- A. Refinish Work supplied with final finish under this DIVISION if damaged to satisfaction of Architect.
- B. Matte black paint finish ducts behind grilles and diffusers where duct is visible.
- C. Thoroughly clean all equipment and all other materials under this DIVISION free from all rust, scale, and all other dirt before covering or painting is done, or the systems put in operation. Leave in condition satisfactory to the Architect.
- D. Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.
- E. Cleaning Ductwork:
  - 1. Clean ductwork inside and out before grilles are installed and before fans are operated. The Contractor shall meet the performance requirements and utilize the evaluation criteria of NADCA Standard ACR 2006, Assessment, Cleaning and Restoration of HVAC Systems.
  - 2. All existing ductwork within the construction area, which is indicated on the drawings to be integrated with new ductwork shall be cleaned as follows. A firm specializing in such work shall be employed.
    - a. Clean all supply and exhaust ducts, duct turns, and other components.
    - b. Clean, paint and lubricate all dampers and linkages.
    - c. Wash all heating coils with non-hazardous detergent and blow clean with CO<sub>2</sub> or Nitrogen.
    - d. Install temporary filter material over every supply diffuser and/or duct opening to catch any dirt or debris during the entire cleaning operation.
    - e. Any damaged sheet metal, which needs repair upon inspection by the Contractor, shall be reported to the Architect.
    - f. Provide duct access panels wherever required.
    - g. All air ducts shall be crawled where possible and shall be vacuumed and wiped clean. A crawl board shall be used wherever possible.
    - h. All surfaces requiring repainting shall have any rusted areas cleaned to bare metal by wire brushing and scraping and the surfaces thoroughly coated with a metal primer and one finish coat of

- aluminum. All surfaces shall be brushed. No spraying will be allowed.
- i. Access panels shall be galvanized and of a gauge equal or heavier than the air ducts, complete with gaskets and screws on 2" centers.
  - j. Filter material for bagging diffusers shall be cotton batting filter material.
  - k. Any ceiling tile damaged during this Work shall be replaced to match existing.
  - l. Any insulation damaged shall be repaired.
- F. At all times keep the premises free from accumulation of waste material and debris caused by his employees. At the completion of the project, remove refuse from within and around the building. All tools, scaffolding and surplus materials shall also be removed, leaving the site of his Work broom clean.

**END OF SECTION**

**SECTION 23 05 00 – BASIC MATERIALS AND METHODS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. The requirements of this SECTION apply to all Work of this DIVISION, where applicable. The materials, equipment and methods herein are generally common to the various SECTIONS of this DIVISION of the Specification. Materials that apply to only one SECTION are generally included in that SECTION. Where items specified in other SECTIONS of this DIVISION conflict with requirements of this SECTION, the former shall take precedence.

**1.02 QUALITY ASSURANCE**

- A. Equipment and Accessories
  - 1. Supply all equipment and all accessories new, free from defects.
  - 2. All items of a given type shall be the product of the same manufacturer.
- B. Reference Standards: Refer to individual Mechanical SECTIONS for additional reference standards.
  - 1. ANSI/ASME - B31.9 Building Services Piping
  - 2. ANSI B2.1 - Pipe Threads
  - 3. ASTM D1557 - Test Methods for Moisture Density Relationships of Soil and Soil Aggregate Mixtures.
  - 4. ASTM D2235 - Solvent Cement for ABS Plastic Pipe and Fittings.
  - 5. ASTM D2564 - Polyvinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings.
  - 6. ASTM D2657 - Heat-Joining Polyolefin Pipe and Fittings.
  - 7. ASTM F493 - Solvent Cements for Chlorinated Poly(vinyl chloride) Plastic Pipe and Fittings.
  - 8. AWWA C209-83 - Cold applied tape coatings for exterior of connections and fittings for steel water pipe lines.
  - 9. AWWA C214-83 - Tape Coating Systems for exterior of steel water pipe lines.
  - 10. AWWA C510-17 Double Check Valve Backflow Prevention Assembly.
  - 11. AWWA C511-17 Reduced-Pressure Principle Backflow Prevention Assembly
  - 12. ASC - Adhesive and Sealant Council.

13. Copper Development Association - Copper Tube Handbook.
14. NEMA-MG1 National Electrical Manufacturer's Association, Motor and Generator Standards.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Access Doors in Ceilings or Walls:
1. Furnish under this DIVISION where shown, or required by Regulatory Agencies and for access to all concealed valves, shock absorbers, unions, fire dampers, etc., even though access doors are not shown for Mechanical Work. Mark each door to establish its location and deliver doors for installation under SECTION 083100. Access doors shall be as specified in SECTION 083100.
  2. Unless otherwise shown or designated, access doors for reaching valves, traps, air vents, duct access doors, and handholes and cleanouts set in walls shall be 12" x 12" for reaching small items within wrist reach of walls, or 24" x 24" for larger items, or items at greater distances than wrist reach, or at ceilings. All ceiling access door locations shall be coordinated with Architectural Reflected Ceiling Plan.
  3. Access doors are not required in T-bar suspended pushout ceilings or accessible tile ceilings.
  4. For any access door not specifically shown on reflected ceiling plans or Architectural elevations, obtain the Architect's approval of the location, size and type.
  5. Access doors shall be Milcor, Bilco, or equal.
    - a. Style A for acoustic tile. Size of this unit must exactly fit single or multiple acoustic tiles.
    - b. Style K for plaster surfaces.
    - c. Style M for masonry, tile, wall board and other non-plastered surfaces.
    - d. U.L. 1 hour B label for one-hour fire rated surfaces.
- B. Adhesives and Sealants:
1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.540.4.2 of the 2016 California Green Building Standards Code. Such products shall also comply

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with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products meeting the requirements of paragraph 5.504.4.1.2 of the 2016 California Green Building Standards Code.

**PART 3 – EXECUTION**

**3.01** (NOT USED)

**END OF SECTION**

## **SECTION 23 05 29 – SUPPORT AND ANCHORS**

### **PART 1 – GENERAL**

#### **1.01 DESCRIPTION OF WORK**

- A. Work included in this Section: Materials, equipment, fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction for the following:
  - 1. Duct Hangers and Supports

#### **1.02 RELATED WORK AND REQUIREMENTS**

- A. Section 230100: General Requirements
- B. Section 230548: Noise, Vibration and Seismic Control
- C. Section 233100: Ductwork

#### **1.03 QUALITY ASSURANCE**

- A. Published specifications standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this Section where cited below:
  - 1. Pipe Supports: ANSI B31.1, Power Piping.
  - 2. California Code of Regulations, Title 24, Building Standards.
    - a. Part 2, California Building Code (CBC).
    - b. Part 4, California Mechanical Code (CMC).
    - c. Part 5, California Plumbing Code (CPC).
- B. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.
- C. All items of a given type shall be the products of the same manufacturer.

#### **1.04 SUBMITTALS**

- A. Submit the following:
  - 1. Shop Drawings showing attachments to structure.
  - 2. Calculations showing deflections of trapeze hangers or other multiple pipe supports.
  - 3. Details of upper hanger attachments for duct and pipe supports with calculations stamped and signed by a Structural Engineer registered in the State of California.

4. Include structural calculations when required by Section 230548 Noise, Vibration and Seismic Control.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Hangers Supports and Miscellaneous Attachment Accessories:
  1. Easton's B-line
  2. Superstrut
  3. Unistrut
  4. Or equal

### **2.02 DUCT HANGERS AND SUPPORTS**

- A. See Section 233100 Ductwork.

## **PART 3 – EXECUTION**

### **3.01 ATTACHMENT TO STRUCTURE**

- A. Wood Beams and Roof Decks;
  1. Through-bolts for roof mounted ducts, pipe and equipment. Provide weatherproofing of penetration where exposed to outdoors.
  2. Beam clamps or beam clips for suspended ducts, pipe and equipment.

**END OF SECTION**



**SECTION 23 05 93 – TESTS AND BALANCING**

**PART 1 – GENERAL**

**1.01 QUALITY ASSURANCE**

- A. Applicator (Erector) Qualifications:
  - 1. System balancing shall be done by a firm regularly engaged and specializing in the field of air and water balancing. Testing and balancing shall be performed in complete accordance with the National Standards for Total System Balance, as published by the Associated Air Balance Council (AABC). The Contractor must be AABC certified. National Environmental Balancing Bureau (NEBB) Certified contractors may perform test and balance work, provided they furnish the same Performance Guarantee as described on page v of the 2002 AABC National Standards. Contractor shall issue such performance guarantee within 30 days of receiving a contract, or 14 calendar days prior to commencing work, whichever is sooner.
  - 2. The Tests and Balancing firm must have experience in projects of similar type and scope and shall submit a list of names and qualifications of all personnel proposed to do this Work. A detailed description of the procedures and the instrumentation employed shall accompany the personnel list. Only experienced personnel and rational orderly procedures will be accepted.
  - 3. The Tests and Balancing Contractor shall contract directly with the General Contractor and shall not be a sub-contractor to the Mechanical Sub-contractor.
  - 4. The final balance report shall be certified by a registered Professional Engineer. Submit the qualifications of the supervisor and engineering technician for review. Personnel shall have past experience of such nature that qualifies them for balancing of these systems.
- B. The Mechanical sub-contractor shall cooperate with the Balancing sub-contractor in the following manner:
  - 1. Performance of pre-balancing requirements of SECTION 230100: GENERAL REQUIREMENTS.
  - 2. Provide under his contract for at least one sheave and drive belt change per fan and for a reasonable number of additional dampers and devices required by Par. 3.03.1.2.
  - 3. Inform HVAC Tests and Balancing Contractor of any major changes made to mechanical systems during construction.
  - 4. Perform pressure testing of piping systems as specified herein.
- C. Requirements of Regulatory Agencies:

1. Air balance between and within rooms in accordance with CCR Title 24, Part 4, Chapter 4.
  2. California Code of Regulations, Title 24, Part 5, California Plumbing Code.
- D. Referenced Standards:
1. AABC - Associated Air Balance Council.
    - a. National Standards for Total System Balance.
  2. American Society of Mechanical Engineers.
    - a. ASME/ANSI B31.9 Building Services Piping.
  3. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.

## **1.02 SUBMITTALS**

- A. Shop Drawings and Product Data:
1. Submit procedure to be followed for air and water balancing, including:
    - a. Detailed procedures.
    - b. Agenda for this project.
    - c. Report forms.
    - d. Project performance guarantee.
- B. Test Reports:
1. Submit six copies of the balance report typed in final form.
  2. Submit six copies of balancing drawings (see Par. 3.03.1.6.).
  3. Submit a written report as necessary, describing any component, i.e., fan drive, damper, pump, valve, etc., which does not function properly.
  4. Submit air balance reports at least two weeks prior to the start date of the final punch list process.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Products and Materials as specified in Part 3 of this Section and related Sections.

## **PART 3 – EXECUTION**

**3.01 AIR BALANCING**

- A. Study the Specifications and Drawings and prepare schedule to inspect equipment of air systems.
- B. Make field inspection prior to closing in portions of systems to be balanced. Verify that all work, fittings, dampers, etc., are properly fabricated and installed as specified or shown and that proper balancing can be done.

**3.02 PREPARATION**

- A. Prepare test and balancing procedures schedule, test record forms and technical information about the air and water systems necessary to balance Work.

**3.03 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION**

- A. Test and Balance Service:
  - 1. The test and balance services shall be performed upon completion of the air handling systems and after completion of general operating tests described under Prebalancing Requirements in SECTION 230100: GENERAL REQUIREMENTS, and after the Work specified above.
  - 2. Upon completion of installation of air systems and after completion of prebalancing requirements, complete the balance tests, analysis and balance of the air and water systems.
  - 3. Recommend adjustments and/or corrections to equipment and air system necessary for proper balancing and submit to the Architect.
- B. Performances and Capacity Checks: Readings shall be taken as shown, specified and as required to demonstrate that the following equipment is operating in accordance with the manufacturer's published ratings:
  - 1. Supply and return fans.
  - 2. Air inlets and outlets: Air inlets and outlets of 200-cfm or less shall be balanced to within 10-percent of design; all other air system readings within 5-percent of design.
- C. Temperature readings shall be accurate to within 1/2-deg F.
- D. Pressure readings shall be accurate to within 0.01-inch W.G. for air systems.
- E. Where changes are made to existing supply or return duct systems, it is the intent of the design, in addition to balancing the new work, to restore all existing branches of the system to the conditions measured and recorded under the Air Prebalancing paragraphs of Section 230100. To do this, the following work is required.

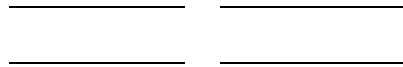
1. After the modification work is completed, measure the available cfm at the point of connection to the existing system. If it is not sufficient to achieve the air quantities shown in the design documents, notify the Architect who will issue instructions how to proceed.
2. After measurements indicate that adequate air quantities are available, balance the new work to the design documents.
3. After completing balancing of the new work, restore all existing branches to the air quantities measured and recorded in accordance with applicable paragraphs of Section 230100. If there are not enough dampers installed to achieve this, add the necessary balancing dampers.

F. Recorded Data:

1. All readings, measurements, and observations shall be recorded on AABC or equivalent printed data sheets and tabulated with appropriate calculations. Recorded data shall include the following:

a. Fan Performance Data:

	ACTUAL	SPECIFIED
CFM	_____	_____
RPM	_____	_____
SP+	_____	_____
SP-	_____	_____
TSP	_____	_____
Amperage	_____	_____
Voltage	_____	_____
Outside Air CFM	_____	_____
Return Air CFM	_____	_____
Outlet Data:		
Total CFM of Outlets	_____	_____
Traverse Total	_____	_____



- b. Air velocities, entering and leaving air temperatures, entering and leaving water temperatures, air pressure drops, at reheat and cooling coils.
  - c. Main and branch duct velocities and static pressures.
  - d. Velocities specified and actual, air volume factors, design and calculated air volumes of supply, return, and exhaust air outlets, size of outlets.
  - e. Room temperatures.
  - f. Air balancing drawings - See Par. 3.03.I.6.
- G. Spot Checking: After the Balancing Contractor has submitted his records of final readings and measurements for all systems, the Architect may make spot checks of each system. If spot-check measurements differ materially from those submitted, the Architect will direct that the systems concerned be completely re-balanced in the presence of the Inspector and that new data be submitted. All systems shall be completely balanced and preliminary balance reports shall be submitted no later than the actual date of completion of balancing.
- H. Air Balancing:
- 1. Air balancing procedures, methods and data recording and reporting shall be in accordance with the applicable portions of AABC National Standards, and as specified herein.
  - 2. Provide additional dampers and pressure plates where required to facilitate balancing and to prevent damper, grille and diffuser noise. All this Work shall be done at no increase in the Contract Amount.
  - 3. Make adjustments at all diffusers and grilles to prevent drafts at the occupant level in the space. Portions of the diffusers and grilles shall be blanked behind these units as directed or required or blades shall be redirected in order to prevent or remove drafts.
  - 4. As part of the air balancing procedure, positive or negative pressure relationships between supply and exhaust CFM shall be achieved in spaces where required by code.
  - 5. All other rooms which are both supplied and exhausted shall be in balance (no difference between supply and exhaust), unless otherwise shown or specified.
  - 6. The Tests and Balancing Contractor shall obtain at his expense a set of reproducible prints of screened architectural reflected ceiling plans. The Tests

and Balancing Contractor shall show in each room, using appropriate uniform symbols, the following information:

- a. A unique number next to each register, grille, or diffuser, keyed to the corresponding measurement in the written report.
  - b. Supply air (cfm) as a positive number.
  - c. If the room is negative to adjacent spaces, the amount (cfm) obtained from adjacent spaces, as a positive number. The drawing shall also show the origin of this infiltrated air, usually as a directional arrow through a door or other opening.
  - d. Return air (cfm) as a negative number.
  - e. If the room is positive to adjacent spaces, the amount (cfm) leaving the room, as a negative number. The drawing shall also show the destination of this exfiltrated air, usually as a directional arrow through a door or other opening.
  - f. Exhaust air (cfm) as a negative number.
  - g. A symbol indicating the pressure relationship of the room to adjacent spaces:
    - (1) E if the room is equal in pressure to adjacent spaces.
    - (2) P if the room is positive to adjacent spaces.
    - (3) N if the room is negative to adjacent spaces.
  - h. Please note that the positive and negative numbers must add up to zero. The infiltrated and exfiltrated air for each space shall be accounted for in each adjacent space. In other words, air exfiltrated from room #1 shall show as infiltration in the adjacent room #2.
7. Where fans with VFD's are used, fan speeds may be adjusted to obtain scheduled flow. On completion of balancing, drive sheaves shall be changed to restore VFD to 57mhz at 100% design flow.
  8. Establish duct static pressure setpoints for all variable volume systems, provide this information to the controls contractor, and record this information in the Balancing Report. The setpoints shall be the lowest value possible to achieve the design CFMs.
  9. Provide means of adding false resistance at filter banks to simulate dirty filter pressure drops. For systems without VFDs on fans and duct static pressure controls, balance for filter loading at midpoint between clean and dirty filter pressure drops.

**END OF SECTION**

## SECTION 23 07 00 – INSULATION

### PART 1 – GENERAL

#### 1.01 DESCRIPTION

- A. Provide complete systems of insulation for ducts as specified.
- B. Related work specified elsewhere: This section does not include acoustic or thermal duct liner where indicated on the drawings to be applied to the interior side of ductwork or plenums. See SECTION 233100, "DUCTWORK".
- C. The intent of these Specifications is that all new supply and return ducts noted be insulated. The Contractor shall carefully advise himself of the extent of all the factory insulated packaged equipment where piping and miscellaneous parts will be furnished without insulation.
- D. Ducts:
  - 1. Insulate new heating and air conditioning supply and return ducts, and to the room outlets. Insulate flexible runouts.
- E. Non-Insulated Ductwork:
  - 1. Where acoustic or thermal duct liner is indicated on the drawings.
- F. Definitions:
  - 1. Finished Spaces: Habitation or occupancy spaces where surfaces are plastered, paneled, or otherwise treated to provide a pleasing appearance.
  - 2. Unfinished Spaces: Storage or work areas where appearance is not a factor; unexcavated spaces, crawl spaces, etc.
  - 3. Concealed Spaces: Spaces between a ceiling and floor construction above; between double walls or furred-in areas; pipe and duct shafts, etc.
  - 4. Exposed: Open to view inside the building (including interstitial spaces). For example, pipe run through a room, and not covered by other construction, is exposed.
  - 5. Outside or exterior: Open to view beyond the exterior side of walls; above the roof; unexcavated or crawl spaces, above or beneath pier floors; in tunnels or exposed on all sides in trenches connected or not connected to an exterior portion of a building.

#### 1.02 QUALITY ASSURANCE

- A. Reference Standards:

1. ASTM American Society for Testing and Materials.
  - a. B 209 Aluminum and Aluminum-Alloy Sheet and Plate.
  - b. C 195 Mineral Fiber Thermal Insulating Cement.
  - c. C 449 Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
  - d. C 533 Calcium Silicate Block and Pipe Thermal Insulation.
  - e. C 547 Mineral Fiber Preformed Pipe Insulation.
  - f. C 553 Mineral Fiber Blanket and Felt Insulation (Industrial Type).
  - g. C 612 Mineral Fiber Block and Board Thermal Insulation.
  - h. E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
2. CCR California Code of Regulations, Title 24
  - a. Part 6, California Energy Code.
  - b. Part 4, California Mechanical Code (CMC).
3. Federal Specifications (Fed. Spec.):
  - a. L-P-535E Plastic Sheet (Sheeting): Plastic Strip: Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid.
  - b. L-T-80BTape, Pressure-Sensitive Adhesive (Aluminum Backed).
  - c. HH-B-100B Barrier Material Vapor (For Pipe, Duct and Equipment Thermal, Insulation).
  - d. HH-I-573B Insulation, Thermal, Flexible Unicellular Sheet and Pipe Covering.
4. UL Underwriters Laboratory, Inc.

**1.03 SUBMITTALS**

- A. Product Data:
  1. Submit manufacturer's data on the following:
    - a. Insulation Materials.
    - b. Jackets and casings.
    - c. Adhesives, mastics and coatings.
    - d. Fastening Devices.
    - e. Vapor Barriers.



- f. Material Safety Data Sheets (MSDS) shall be submitted for all insulation materials including adhesives, cements and finishing materials.
- g. Proof of California Quality Standards Certification.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. **Manufacturer's Stamp or Label:** Every package or standard container of insulation, jackets, cements, adhesives, and coatings delivered to the project site for use must have the manufacturer's stamp or label attached giving name of manufacturer, brand, and description of material. Insulation packages and containers shall be marked "asbestos-free."
- B. All insulation materials subject to regulation under CCR Title 24, Part 6, shall meet the requirements of Section 123 and 124, and Table 123-A, and shall be so certified. Submit proof of certification.
- C. **Fire Resistance:** Insulation, adhesives, vapor-barrier materials, and other accessories, except as specified herein, shall be noncombustible. Materials shall not have a flame-spread rating more than 25 and a smoke-developed rating not more than 50 in accordance with UBC Standard 42-1, except for flexible unicellular insulation which, in thickness greater than 1/2-inch, may have a smoke-developed rating not to exceed 100.
- D. **Materials Tests:** Test factory-applied materials assembled. Field-applied materials may be tested individually. UL label, or satisfactory certified test report from an approved testing laboratory, will be required to show that fire hazard ratings for materials proposed for use do not exceed those specified. Flame-proofing treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.
- E. **Ductwork insulation:** Shall conform with the referenced publications. Temperature ranges and densities in pcf shall be as specified.
  - 1. **Fiberglass Duct Wrap:** Fiberglass blanket with foil reinforced kraft (FRK) paper vapor barrier; 250 degrees F. maximum; 0.24 Btu/in/hr/sq.ft./degree F. at 75 degree F. mean temperature with 25% compression. Owens Corning Type ASW with FRK facing; Certain-Teed or equal.
  - 2. **Flexible Mineral-Fiber Blanket:** ASTM C 553, Type I (flexible resilient), up to 1000 degrees F, 0.28 Btu/in/hr/sq.ft./degree F. at 100 degree F. mean temperature. Owens Corning TIW Type I; Certain-Teed or equal.
  - 3. **Rigid Mineral-Fiber:** ASTM C 612, board type, to 450 degrees F, 3 pcf, foil reinforced kraft facing or all-service jacket facing. Owens Corning Type 703 with FRK jacket; Certain-Teed or equal.

4. Mineral Fiber Block: ASTM C 612, semi rigid, bonded fiberglass fibers, 850 degrees F. maximum; 3.0 pcf; 0.23 Btu/in/hr/sq.ft./degree F. at 75 degree F. mean temperature. Owens Corning Insul-Quick; Certain-Teed or equal.
- F. Insulation Jackets:
1. Vapor-Barrier Material: HH-B-100, Type I. Material shall be resistant to flame and moisture penetration and not support mold growth. Provide foil reinforced kraft facing in concealed locations. Provide vapor-barrier material all service jacket on insulation in exposed locations with a white surface suitable for painting without sizing. Lamtec 70JASJ or approved equal.
  2. Aluminum Jackets: ASTM B 209, Temper H14, 0.016 inch thick, smooth. Do not use on calcium silicate surfaces or surfaces above 200 degrees F operating temperature. Pabco-Childers Aluminum Roll Jacketing for straight piping and Pabco-Childers Sure-Fit for elbows, or approved equal. Secure in place with Childers Fabstraps, Pabco Pab-Bands, or approved equal.
  3. Weatherproof: Aluminum jacket, ASTM B 209, minimum 0.016-inch thick, moisture barrier adhered to inside face. Fabricate and install jacketing with a continuous modified Pittsburg Z-Lock on the longitudinal seam. Seal each butted section of jacketing with a butt strap containing high temperature sealant and secure with Childers Lock-On, Pabco Z-Lock, or approved equal.
  4. PVC Jackets: (limited to indoor piping only). Fed. Spec. L-P-535, Composition A, Type II, Grade GU. One-piece premolded plastic covers for fittings, flanges, and valves. Zeston, Speedline, or approved equal.
- G. Removable/Reuseable Insulation: Shall be one or two piece design with silicone coated fiberglass cloth liners, minimum of 1/2-inch thick fiberglass insulation, and a weather barrier of teflon coated fiberglass. Sewing thread shall be teflon coated fiberglass. Quilting pins shall be used to prevent shifting of insulation. Covers shall have rain flaps and straps with stainless steel double buckles or Velcro fasteners. Johnson Energy Products, Accessible Products Co., or approved equal.
- H. Adhesives, Sealants, Coatings and Compounds: Shall be compatible with materials to which applied and suitable for the service. Shall comply with South Coast Air Quality Management District VOC regulations (SCAQMD Rule #1168, effective date of July 1, 2005, rule amendment date of January 7, 2005).
1. Vapor-seal and Fiberglass Insulation Adhesive: Foster Quick Tack 85-60 or approved equal, ASTM C 916, Type II. U.L. Label. Adhesive shall meet California Dept of Public Health (CDPH) Standard Method Ver. 1.1, 2010 Small Scale Environmental Chamber Test for VOCs. for CA Specification 01350.
  2. Lagging Adhesive: Fosters 30-36 or equal, U.L. Label

3. Insulation Cement: ASTM C 195, mineral fiber, thermal conductivity 0.85 max. at 200 degrees F mean when tested per ASTM C 177. Fibrex, Pabco, or approved equal
  4. Vapor Barrier Coating: Foster 30-65, Childers CP-34 or approved equal, U.L. Label, (indoor only above 60 degrees F). Permeance shall be 0.03 perms or less at 45 mils dry as tested by ASTM E96. Coating shall meet California Dept of Public Health (CDPH) Standard Method Ver. 1.1, 2010 Small Scale Environmental Chamber Test for VOCs. for CA Specification 01350.
  5. Weather Barrier Breather Mastic: Childers Vi Cryl CP-10/CP-11, Foster Weatherite 46-50, Eco Mastic 55-50 or approved equal
  6. Reinforcing Mesh: Childers Chil Glas #10; Foster Mast a Fab or approved equal.
  7. Metal Jacketing Sealant: Childers CP-76; Foster 95-44 Tite-fit 30-35, or approved equal, U.L. Label, (indoor only above 60 degrees F).
  8. Adhesive for Flexible Unicellular insulation: Rubatex R-373, Armstrong 520 or approved equal.
- I. Accessories:
1. Staples: Corrosion-resistant outside-clinch type. Bostitch, Duo-Fast or approved equal.
  2. Insulation Bands: ¾-inch wide; 0.018-inch stainless-steel or 0.020-inch aluminum. Band-It, Houdaille, or approved equal.
  3. Bands for Metal Jackets: 3/8-inch minimum width; 0.018-inch stainless-steel or 0.020-inch aluminum. Pabco-Childers or approved equal.
  4. Wire: Minimum 16-gauge stainless steel or copper-clad annealed steel wire.
  5. Anchor Pins: Anchor pins, clips and speed washers; AGM Industries, Accessible Products, or approved equal.
  6. Aluminum-Foil-Backed Pressure Sensitive Adhesive Tape: Fed. Spec. L-T-80, 50 degrees F max. and limited to use on insulation with factory-applied jacket with aluminum foil facing. Venture Tape, Compac Corp. or approved equal.
  7. Vapor-Barrier Material Tape: Fed. Spec. HH-B-100, Type I, pressure sensitive adhesive backed, Lamtec 70JASJ, Ideal Tape Co. or equal.
  8. Glass Cloth and Tape: Childers No. 10, J.P. Stevens Glass-Tex, open weave, white color cloth.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION/APPLICATION/ERECTOR**

A. General:

1. During the installation and when putting insulated systems into service, the contractor shall observe all instructions, recommendations, and Cautions issued or published by the insulation materials manufacturers.
2. Preparation: Do not apply insulation until surfaces to be covered have been leak tested, have had rust and scale removed, and have been cleaned, dried, and inspected.
3. Application: Insulation shall be clean and dry when installed and kept dry during finish application. Wetted insulation will not be approved for installation. Install materials neatly with smooth and even surfaces with jackets drawn tight and smoothly cemented down on longitudinal and end laps. Scrap pieces shall not be used where a full-length section will fit. All surface finishes shall be extended to protect all surfaces, ends, and raw edges of insulation. Coatings and adhesives shall be applied at the manufacturer's recommended coverage per gallon.
4. Name Plates and Access Plates: Do not insulate name plates or ASME labels. Bevel insulation around name plates and ASME stamps.
5. Calcium Silicate: Do not install on aluminum surfaces.

B. Ductwork:

1. Where ducts run in groups too close to be individually insulated and finished, completely fill all spaces between ducts with rigid or flexible insulating material and insulate the group of ducts as one duct.
2. Where ducts cannot be insulated after erection, insulate prior to installation.
3. Access Plates and Doors: On internally insulated ducts, plenums, and casings, continue insulation on access plates and doors. Bevel insulation around access plates and doors. For externally insulated ducts provide duct access doors as per 233100 Ductwork and terminate the covering neatly at the ends around the access door using channels and vapor barrier taping.
4. Rigid Insulation: Use in Mechanical Rooms and exposed locations. Secure rigid insulation by impaling over pins or anchors located not more than 3 inches from edge of boards and spaced on not more than 18-inch centers; secure with washers and clips. Spot-weld anchor pins or attach with an approved waterproof adhesive especially designed for use on metal surfaces. Each pin or anchor shall be capable of supporting a 20-pound load. Protruding ends of clips shall be cut off flush after clips are secured and sealed with aluminum backed pressure sensitive tape and coated with vapor barrier coating. Apply insulation with joints tightly butted. Where vapor barrier is specified, all joints, breaks, punctures, and voids shall be filled with vapor barrier coating and covered with vapor seal material identical to that surrounding.

5. Flexible Duct Wrap Insulation: Use in all concealed locations. Apply over clean, dry sheet metal ductwork that has been sealed air-tight at all seams and joints. Install to allow maximum fullness at corners (avoid excessive compression). Minimum thickness at corners is 1-inch. Butt insulation tightly at joints; vapor barrier facing shall be overlapped a minimum of 2-inches. Staple all seams approximately 6-inches on center with outward clinching staples, then seal with a foil vapor barrier tape, and vapor barrier coating. When ducts are over 24-inches in width, the duct wrap shall be additionally secured to the bottom of rectangular ducts with mechanical fasteners spaced on 18-inch centers, maximum, to prevent sagging of insulation. Seal penetration of facing to provide a vapor tight system.
  6. Insulation Thickness:
    - a. Fibrous glass blanket, foil-scrim-kraft facing. Thickness: 1-1/2 inches for concealed ductwork, 2-inch where required by the California Energy Code, including but not limited to:
      - (1) Outdoors;
      - (2) In space between the roof and an insulated ceiling;
      - (3) Unconditioned spaces.
    - b. Fibrous glass board, 3-pound density, foil-scrim-kraft facing, vapor sealed. For ductwork plenums and casings exposed to view:
      - (1) Match sizes of reinforcing and connecting angles. Verify sizes of angles in field: Minimum 1-inch thick.
      - (2) In General:
        - (a) To 42-Inches Wide: 1-inch.
        - (b) 43-Inches Wide and Over: 1-1/2-inches.]
- C. Insulation Finish:
1. Provide Fed. Spec. HH-B-100, Type I, vapor barrier covering for piping and ducts. Vapor barrier surfaces shall be suitable for painting.
  2. Ducts:
    - a. Insulation on fittings, elbows, and irregular surfaces shall be finished the same as hot piping with special care taken to seal all joints including butts to ensure a continuous vapor barrier. On insulated cold fittings and valves, coat the insulation with vapor barrier coating and reinforcing mesh to prevent moisture ingress.

**END OF SECTION**

**SECTION 23 31 00 – DUCTWORK**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Work includes air distribution and collection system including appurtenances.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 230100: General Requirements.
- B. Section 230500: Basic Materials and Methods.
- C. Section 230529: Supports and Anchors.
- D. Section 230593: Testing & Balancing.

**1.03 QUALITY ASSURANCE**

- A. Design Criteria: Contribution to noise level not to exceed NC 33 except in service and equipment spaces.
- B. Flexible Fabric Connector Material and Flexible Duct: Shall meet the requirements of NFPA Standards Nos. 90A and 90B.
- C. Flexible Fibrous glass duct liner: shall comply with NFPA 90A/90B and ASTM C1071.
- D. Flexible Ducts: Underwriter's Lab. 181 Class 1.
- E. Referenced Standards - The latest editions of specifications standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this section where cited below:
  - 1. Adhesive and Seal Council - ASC - 7100C Standard for Adhesives for Duct Liner.
  - 2. CCR - California Code of Regulations, Title 24, Part 4, California Mechanical Code:
    - a. Chapter 6, Duct Systems.
    - b. Standard 6-2, Galvanized Sheet Metal
    - c. Standard 6-6, Standard for Metal Ducts
  - 3. SMACNA - Sheet Metal and Air Conditioning Contractors National Association:

- a. HVAC Duct Construction Standards, Metal and Flexible, Third Edition, 2005 with Addendums.
  - b. Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, Fourth Edition, 1992.
  - c. HVAC Systems Testing Adjusting and Balancing.
  - d. HVAC Air Duct Leakage Test Manual 1st Edition.
4. NFPA - National Fire Protection Association:
- a. NFPA 90A, Installation of Air Conditioning and Ventilating Systems
  - b. NFPA 90B, Installation of Warm Air Heating and Air Conditioning Systems.
  - c. NFPA 96, Ventilation Control and Fire Protection of Commercial Cooking Operations.

#### **1.04 SUBMITTALS**

- A. Submit large-scale drawings in accordance with the requirements of Section 01300, "SUBMITTALS" and as follows:
  - 1. Fully coordinated 1/4-inch scale dimensioned duct layout drawings of all mechanical rooms, riser elevations, and floor plans, giving complete dimensions for location, elevation, and clearance, showing work of all other Sections and Divisions. Layout drawing shall be prepared with architectural floor plan and ceiling grid background indicating room numbers, ceiling heights, location and elevations of structural components, light fixtures and other equipment.
- B. Method of attachment of duct hangers to building construction.
- C. Product Data: Submit duct material, shape, gauge, type of joints and duct reinforcing for each size range, for joints, method of fabrication and reinforcing. Submit acoustic lining, duct access doors, duct fitting construction detail, duct sealant, flexible connection and plenum construction detail. Submit manufacturer's catalog data sheets for air distribution and other devices.
- D. Sample round welded duct fitting.

### **PART 2 – PRODUCTS**

#### **2.01 MATERIALS**

- A. Sheet Metal:
  - 1. Black or Galvanized Steel as specified:

- a. Per California Mechanical Code (CMC) Section 602.
  - b. Cold rolled steel sheets, lock forming quality meeting ASTM A-924 A-653/A-653M.
  - c. Where paint is to be applied, prepare galvanized steel surfaces per ASTM D2092.
2. Lead Sheets: Federal Specification QQ-L-301a, Grade C., 6 millimeters thick.
  3. Aluminum sheets: ASTM B209, maximum 0.4 percent copper. Provide mill-finish commercial sheets; 16,000 pounds per square inch minimum strength.
- B. Duct Hangers:
1. Band Hangers: Same material as ducts, except that hangers for stainless steel ducts in unfinished spaces may be galvanized steel.
  2. Rod-Type Hangers: Mild low carbon steel, unless otherwise specified; fully threaded or threaded each end, with two (2) removable nuts each end for positioning and locking rod in place. Unless galvanized or cadmium plated, provide a shop coat of red lead or zinc chromate primer paint.
- C. Miscellaneous Fasteners and Upper Hanger Attachments:
1. Sheet Metal Screws: Zinc coated, with organometallic polymer thermoset corrosion resistant coating similar to Climaseal by ITW Buildex.
  2. Machine Bolts and Nuts: Galvanized or cadmium plated steel.
  3. Concrete Inserts: Steel or malleable iron of the continuously slotted type of Universal inserts.
  4. Welding Studs: DSM Products, capacitor discharge, low carbon steel, copper flashed.
  5. Self-Drilled Expanding Fastener: Phillips type.
  6. Expansion Shields: per Section 230529.
  7. Electrically operated tools for installing welded studs and fasteners shall be listed by a nationally recognized test agency.
- D. Flexible Duct Liner: Fibrous glass duct liner, acrylic surface treatment on air side. Manville Permacote Linacoustic (no known equal). Liner for round ducts shall be performed round fiber glass, Manville Permacote Spiracoustic (no known equal). Coat duct liners with an EPA registered fungicide that prevents the growth of mold, fungus or bacterial. When tested in accordance with ASTM C1338, UL 181 or ASTM G21 there shall be no growth of mold, fungal or bacterial.
1. Except where shown otherwise duct liner shall be 1" thickness.



2. Minimum sound-absorption coefficients (ASTM C423 Mounting Type A) for sound-absorbing duct lining material for rectangular ducts:

	Octave Band Center Frequency, HZ					
	125	250	500	1000	2000	4000
1" thickness lining, 2.0-3.0 pcf density	.09	.31	.67	.91	1.01	.98
1.5" thickness lining, 2.0-3.0 pcf density	.21	.53	.90	1.03	1.01	1.00
2" thickness lining, 2.0-3.0 pcf density	.20	.57	1.02	1.03	1.02	1.03

3. Minimum sound-absorption coefficients (ASTM C423 Mounting Type A) for sound-absorbing duct lining material for round ducts:

	Octave Band Center Frequency, HZ					
	125	250	500	1000	2000	4000
1" thickness lining, 2.0-3.0 pcf density	.05	.21	.71	1.01	1.07	1.04
1.5" thickness lining, 2.0-3.0 pcf density	.10	.39	1.02	1.08	1.04	1.00

E. Flexible Connections - Fabric:

1. Provide UL listed Glass fabric weighing a minimum of 24-ounces per square yard coated on both sides with DuPont Hypalon inorganic elastomeric material, suitable for indoor/outdoor use, similar to "Durolon" as manufactured by Duro Dyne Corporation.
2. Fabric and metal shall be joined by means of a double lock seam of pre-fabricated, pre-assembled fabric connectors with minimum No. 24 USS gauge metal edges similar to "Metal-Fab" as manufactured by Duro Dyne Corporation or approved equal, with double-lock gripping fingers of metal-to-fabrics similar to "Grip-Loc" as manufactured by Duro Dyne Corporation, or approved equal.

F. Flexible Duct:

1. Provide duct of dual element construction consisting of a corrosion resistant galvanized steel support spiral, mechanically locked to reinforced coated glass fabric, conforming to California Mechanical Code/Uniform Mechanical Code Standard 6-5, Class 1.
2. Factory insulate the flexible duct with fiberglass insulation with an R value of not less than 4.2 at a mean temperature of 75 deg. F. Provide an internal impervious liner to separate the insulation material from conditioned air stream.
3. Cover the insulation with a fire retardant metalized vapor barrier jacket reinforced with crosshatched scrim having a permeance of not greater than 0.05 perms when tested in accordance with ASTM E96.
4. Flexible ductwork shall have internal working pressure rating of 6 in.wg. positive and 2 in.wg. negative, be rated for 4000 fpm and a temperature range of -20 deg F to 250 deg F.
5. Acoustical insertion loss of a 10 foot length of straight flexible duct, when tested in accordance with ASTM E477 at a velocity of 2500 fpm shall be not less than:

Octave Band	2	3	4	5	6	7
Hz	125	250	500	1000	2000	4000
6" dia	7	31	40	38	40	27
8" dia	13	29	36	35	38	22
12" dia	21	28	29	33	26	12

6. The self generated sound power levels (LW) dB re 10-12 Watt of a 10 foot length of straight duct for an empty sheet metal duct when tested in accordance with ASTM E477, at a velocity of 1000 feet per minute, shall not exceed:

Octave Band	2	3	4	5	6	7
Hz	125	250	500	1000	2000	4000
6" dia	42	31	23	18	17	21
8" dia	41	34	27	19	18	21
12" dia	54	45	38	31	28	23

**2.02 FABRICATION AND MANUFACTURER**

- A. Ducts, plenums, flashings, and other duct appurtenances shall be fabricated of prime galvanized steel and shall conform to the construction standards of the CMC Chapter 6 and Appendix A, and in accordance with current SMACNA Duct Construction Standards and SMACNA pressure classification and seal classes listed for ductwork systems involved.
1. Rectangular ductwork:
    - a.  $\pm$  1 inch WG Class with Seal Class C: Supply air ductwork downstream of terminal boxes.
    - b.  $\pm$  2 inches WG Class with Seal Class B: Return air ductwork and general exhaust ductwork not used for smoke exhaust.
    - c.  $\pm$  3 inches WG Class with Seal Class A: Constant volume or variable volume supply air ductwork.
    - d.  $\pm$  4 inches WG Class with Seal with Seal Class A: Return and exhaust air ductworks used for smoke exhaust.
    - e.  $\pm$  5 inches WG Class with Seal Class A: Hazardous exhaust systems for hoods and safety cabinets.
  2. Gauge reduction permitted for cross broken ducts. Beaded ducts permitted only if approved by enforcing agency and any duct with wall vibration exceeding .05 inches during operation is retrofitted with stiffening angle.
- B. Round and flat oval ducts shall be used where shown. Round duct transverse joints shall be beaded sleeve, up to 24" diameter and bolted angle rings or "Spiralmate" formed angle and closing ring, secured to duct with screws, for ducts greater than 24" diameter.
- C. Longitudinal joints shall be Pittsburg lock. Button punch snap locks may be used if sealed by injection of Ductmate 5511M Sealant into the button punch snaplock seam. No "S" slip or drive slip transverse joints shall be used. Transverse joints shall be pocket locks. "Ductmate" system joints may be used in lieu of pocket locks.
- D. Round and Oval Ductwork
1. SMACNA Pressure Classification positive or negative 2 in. w.g., with Seal Class B, for general use.
  2. SMACNA Pressure Classification negative 4 in. w.g., with Seal Class A, for ductwork used in smoke exhaust ductwork.
  3. Factory or shop fabricate interlocking spiral lockseam duct, without external standing rib upstream of volume control boxes, with external rib downstream of boxes and for single branches of return air duct system.
  4. Prefabricated Fittings:

- a. Site fabricated fittings and saddle taps not permitted.
  - b. Same manufacturer as duct.
  - c. Continuously welded seams, except downstream of pressure regulating volume control dampers where spot welds on 1" centers are allowed.
  - d. Die stamped elbows for 8 inches or smaller. Optionally to 12-inches diameter.
  - e. Elbows larger than 8 inches.
    - (1) 2 gores - less than 35 degrees.
    - (2) 3 gores - 36 degrees through 71 degrees.
    - (3) 5 gores - over 71 degrees.
  - f. "Spin-in" round taps into rectangular ducts to be conical with welded seams.
  - g. Tee and cross fittings to have conical branches.
5. Not acceptable:
- a. Corrugated or flexible metal duct.
  - b. Duct or fittings not of quality equal to sample.
  - c. "Spin-in" round taps connecting to rectangular ducts except where branch flow is less than 15% of flow in rectangular duct.
  - d. Adjustable elbows.
  - e. Site fabricated fittings and saddle taps.
- E. Fume Hood Exhaust Ducts: 316 Stainless Steel Welded Construction.

**2.03 REGISTERS AND GRILLES**

- A. Acceptable Manufacturers
  - 1. Titus
  - 2. EH Price
  - 3. Nailor
  - 4. Krueger
- B. Grilles and Registers: (See Schedule on Drawings)
  - 1. Unless otherwise shown or specified, fabricate all grille and register faces and frames of steel or aluminum with a factory-applied finish as follows:

- a. For installation in gypsum board, hard plaster or acoustic plaster ceilings specified to be painted, finish shall be a factory-applied white baked enamel.
  - b. For installation in walls, specified to be painted, finish shall be factory applied white baked enamel.
  - c. For acoustic tile ceilings, provide factory applied white baked enamel.
2. Provide frames for each grille and register except as follows:
- a. Grilles and registers installed directly in exposed uninsulated ductwork.
  - b. Grilles or registers specifically designed for installation in suspended lay-in tile ceilings or suspended combination lay-in and splined tile grid ceilings.
3. Supply Grilles except where otherwise scheduled: Provide adjustable, double-deflection type, consisting of a heavy formed face, with rear bars or vanes installed in a No. 20-gauge frame of the same material as the bars or vanes. Install face bars and rear bars or vanes on nominal 0.75-inch centers, individually adjustable and front pivoting to any desired setting.
4. Supply Registers: Provide assembly consisting of a register face and damper assembly. Provide register face of the adjustable double deflection type consisting of a heavy formed face, with rear bars or vanes installed in a No. 20-gauge frame, of the same material as the bars or vanes, with the face and rear bars or vanes on nominal 0.75-inch centers; individually adjustable and front pivoting to any desired setting. Provide damper assembly of the opposed multiblade type consisting of a frame, blades and a key operated movement of the locking type, with the operator projecting through the frame. Provide operators which are removable or permanently secured in place, as directed. Damper may be omitted on individual branches with remote duct damper.
- C. Frames for Registers and Grilles:
1. Provide frames fabricated from a minimum of No. 20-gauge extruded aluminum, to match the material and finish of the grille or register face required to be installed in same, with interlocked and mechanically staked corner joints. Furnish frames complete with felt or sponge rubber gaskets, except when they are used as plaster stops on all four sides.
- D. Air Diffusers:
1. Provide diffusers of the circular, square, rectangular, or linear type as scheduled. Do not use neck or duct connection sizes shown to size diffusers.
  2. Ceiling diffusers shall be of the high-induction type with removable core and trim. Finish same as grilles and registers.

3. Provide all branch ducts to grilles and diffusers complete with volume dampers. Where it is not possible to install volume dampers in ducts, provide grilles and diffusers fitted with opposed blade, key-operated dampers located directly behind the grille or diffuser. Furnish 2 keys for each type of operator.
  4. Grilles and diffusers shall be constructed so that the connection to the duct may be taped from the inside when outside is inaccessible.
  5. All ceiling grilles and diffusers shall be located as shown on drawings.
  6. Where substitutions are offered, diffusers shall be sized for the air quantities and location shown and shall provide a maximum air velocity of 50 feet per minute at a level of six feet or less above the floor without exceeding noise level of specified diffuser.
  7. Ceiling plaque registers will not be acceptable as a substitution unless these units are specifically shown or specified.
  8. Circular, Square, and Rectangular Diffusers: Provide diffusers complete with a volume control damper except where outlet has an individual remote duct damper; and an adjustable equalizing grid. Fabricate the volume control damper and equalizing grid from same material and with the same finish as the diffuser. Diffuser shall have specially designed outer rings or rims with contours of sufficient depth below the ceiling line to minimize smudging.
  9. Linear diffusers to have borders of the type scheduled so as to coordinate with architectural finish.
- E. Provide concealed mounting of all grilles, registers and diffusers.
- F. Finishes and finish colors of all exposed items shall be selected by the architect unless otherwise noted.

## **2.04 DUCTWORK ACCESSORIES**

- A. Dampers:
1. Manual Volume Dampers:
    - a. In rectangular branch ducts greater than 9-inches high, provide opposed-blade-type dampers with frames of minimum 16-gauge formed channel, minimum 3-1/2 inches wide with minimum 7/8-inch deep flanges. In rectangular branch ducts 9-inches high or less, provide single-blade dampers with frames of minimum 4-1/2 inch x 12-gauge material, or 3-inch wide x 22 gauge with folded angle or flange minimum 2 inch high. Fabricate all damper blades, axles, and frames of the same material as the ductwork in which they are to be installed. Blades: 16-gauge minimum. Blades to close against bead or flange or provided with edge seal. Blades in multiblade dampers: 8-inches wide maximum.

- b. In round or flat oval branches damper blade to be minimum 12 gauge to 18" major axis, 10 gauge for larger than 18", frame to be minimum 18 gauge channel, axles to be minimum 2" diameter plated steel. Flat oval dampers with major axis greater than 36 to have center mullion. Dampers to be similar to Ruskin CDR25, CD025 or United McGill SOSVH or SRSVH Type 2.
2. Duct Damper Hardware: Hardware shall be similar to Ventfabrics "Ventlock" as follows:
- a. Uninsulated Duct Dampers above accessible ceilings:
    - (1) Shaft lengths up to 18-inches:
      - (a) No. 635, 3/8-inch Dial Regulator with No. 607 gasketed end bearing.
    - (2) Shaft lengths 19-inches to 48-inches:
      - (a) No. 641, 1/2 inch Self-locking Regulator and No. 607 gasketed end bearing.
  - b. Insulated Duct Dampers above accessible ceilings:
    - (1) Shaft lengths up to 18-inches:
      - (a) No. 637, 3/8-inch Dial Regulator with No. 607 gasketed end bearing.
    - (2) Shaft lengths 19-inches to 48-inches:
      - (a) No. 644, 1/2 inch Self-locking Regulator with No. 607 gasketed end bearing.
  - c. Insulated and Uninsulated Duct Dampers above inaccessible ceilings: Install same rod sizes and end bearings for shaft lengths indicated in 2.4.B.1 and 2.4.B.2 above. Install No. 680 miter gear with No. 677 Concealed Damper Regulator. Regulator cover plate shall be natural zinc, prime painted to match ceiling color finish; install flush with ceiling. Submit installation details showing attachment to ceiling support structure. Alternately, a Bowden Remote Cable Controls model 270-275 by Young Regulator Company (no known equal) may be used.
  - d. U-Bolt Blade Fasteners, if used, shall be: No. 615, spaced at 12-inches on-centers maximum.
  - e. Provide all couplings, joints, screws, rods, linkages, etc., to complete the installation.
  - f. On round and flat oval ducts bearings to be mounted on flat surface raised from duct curvature, bracket to be attached with minimum of four screws.

- B. Turning Vane Assemblies:
1. Fabricate vane assemblies of the same material as the ductwork in which installed. Provide individual vanes of the hollow airfoil type, rigidly connected to vane rails, with the rails screwed into the duct fitting.
  2. Turning vanes shall not be used in exhaust ducts.
- C. Gasket Material:
1. For use with registers, grilles, and diffusers installed in exposed uninsulated ductwork: 1/4-inch thick felt or sponge rubber material, of width as required by the flange on the particular device.
  2. For use with flanged joints in ducts: 1/8-inch thick reinforced inert plastic of the self-conforming type, of width as required by the particular flange.
- D. Duct Tape and Sealants:
1. Hardcast CCWI-181 or Hardcast Aluma-Grip AFT-701.
  2. Foster 32-19
  3. Childers CP-146
- E. Duct Access Doors:
1. Provide access doors with a minimum size of 20 inches by 14 inches. Provide larger size where required for access. In ducts with maximum dimension less than 14 inches, provide bolted flanged section for a section of ductwork with a minimum length of 20 inches.
  2. Fabricate of the same material, finish and gauge as the ductwork in which installed, unless otherwise shown.
  3. In uninsulated ducts provide folded edges on all four sides of door panels, lapping 1-inch over the outside surface of the duct, on each of the four edges of the duct opening. Provide each door with a continuous hinge and with two (2) casement fasteners for doors over 16 inches high.
  4. In insulated ducts provide hollow metal doors of thickness to match insulation, fabricated from a minimum of No. 20-gauge sheet. Design lock edge of doors with a bevel of 1/8-inch in 1-inch and fill the interior hollow space with insulation, thermally equivalent to the ductwork insulation. Lap the inner face of the door over the duct opening, a minimum of 1/4-inch on all four edges of the free duct opening. Frame the duct opening for each door with a continuous 1-inch x 1-inch x No. 12-gauge sheet metal angle, of the same material as the duct in which installed, riveted to the exterior surface of the duct opening. Provide each door with a continuous hinge and a surface type latch with inside striker for contracting inside of door framing, so as to provide a compression fit. Provide doors over 16 inches high with a minimum of two



- latches. Provide all doors with  $\frac{3}{4}$  inch wide sponge rubber or felt gasket, around all four sides of duct opening.
5. Provide Ruskin ADH series for 24"x24" and smaller access doors for flat ductwork, Ruskin series GPAD for larger than 24"x24" access doors and Ruskin series ADR for round ductwork.
  6. Access points shall be permanently identified on the exterior by a label with letters not less than 2 inch in height per CMC Section 605.5.
- F. Duct Access Door Hardware:
1. Butt Hinges: Provide galvanized steel with brass pins, approximately 2-inches x 1-1/2-inches wide for doors under 25 inches high and 3-inches x 2-inches wide for doors over 24 inches high.
  2. Casement Fasteners: Steel or cast aluminum with galvanized or aluminized finish.
  3. Door Latches: Ventfabrics, Inc. Ventlock 100 series for 24"x24" and smaller access doors, and Ventfabrics, Inc. Ventlock 260 series or Duro Dyne Corp. SP Series for larger than 24"x24" access doors.

## **PART 3 – EXECUTION**

### **3.01 DUCT INSTALLATION - GENERAL**

- A. Installation of ducts shall conform to requirements of CMC Chapter 6, Section 603.
- B. Elbows:
  1. Use radius elbows in rectangular ducts unless otherwise indicated. Centerline radius shall be a minimum of 150% of duct width.
  2. Where space does not permit duct radius specified above, install short radius or square elbow with vanes per SMACNA duct construction standards.
  3. Do not use turning vanes in Grease and vapor exhausts; Fume hood exhaust; Breeching; Toilet exhaust ducts; any gravity ductwork; Clothes dryer exhaust or Hoistway vent.
  4. For 2 inch water gauge or above pressure class ductwork, spot weld turning vanes to duct.
- C. Install ductwork to provide maximum headroom. Properly seam, brace, stiffen, support, and render ducts mechanically airtight. Adjust ducts to suit local conditions and if necessary to accomplish this, dimensions may be changed but only after review by the Architect. Cross-sectional area shall be maintained.

- D. If beading is substituted for crossbreaking transverse reinforcing must be increased such that no panel deflection exceeds +/-5 mils, when system is operating. Beading to be at right angles to air flow.
- E. Provide ductwork connected to air handling equipment or air inlet and outlet devices, with all necessary transformation pieces, flexible fabric connections, as shown or required.
- F. Joints and Seams: Tape all plenum joints and all duct transverse joints and field formed seams air tight in accordance with CMC Chapter 6, Section 602.3. Tape shall be extended a minimum of one-inch beyond joint or seam opening. Apply tape internally in large supply plenums and externally in large exhaust plenums. Tape shall also be applied at duct connection to diffusers and grilles, and at all longitudinal button lock seams.
- G. All seams and joints in ductwork exposed to the weather shall be waterproofed by application of Foster 32-19, Childers CP-146, Hardcast CCWI-181 or Hardcast Alumina-Grip AFT-701.
- H. Where internal insulation is applied, duct sizes as shown on the Drawings shall be inside clear dimensions.
- I. Install ductwork exposed to the weather with double-sloped roof, and arrange duct support elements, to promote drainage of precipitation and prevent standing water.
- J. Notify Architect where duct dimension field changes are required in order to conform with the building structure or to avoid interfering with other trades.
- K. Provide access doors, whether indicated on the drawings or not, at the following locations:
  - 1. Where access is required to assemble duct mounted devices.
- L. Vapor Hood Exhaust Ductwork:
  - 1. Slope duct 1 inch per foot down toward dishwasher, vapor hood or shower room. If above slope is impossible, slope 3 inch per foot down in direction of air flow to low point and provide a duct drain. Refer to Duct Drains as specified in this Section.
  - 2. Do not crossbreak bottom panels of duct. Locate access panels on the side of duct.
- M. Grease Hood Exhaust Ductwork
  - 1. General:
    - a. Include from hood connection to fan discharge and through building to atmosphere.

- b. Slope of Duct: One inch per foot toward hood or toward an approved grease reservoir. Slope may be reduced to ¼ inch per foot if total length toward hood or toward an approved grease reservoir does not exceed 75 feet.
- 2. Provide fire rated duct enclosure from point of duct concealment to the exterior of the building. Coordinate location of enclosure access doors with duct access doors.
- 3. Dampers are not allowed in grease exhaust systems.
- 4. Provide cleanout doors at the following locations:
  - a. Horizontal and Vertical Ducts:
    - (1) At all grease reservoirs; all changes in direction; fire protection devices; at base of vertical duct
  - b. Size:
    - (1) Maximum 24 inches by 24 inches.
    - (2) Minimum 18 inches one side, other side 3 inches less than duct height.
    - (3) Coordinate location and size with duct enclosure access doors
  - c. Joints shall be continuously butt welded grease tight.
- N. Construction shall comply with Section 504.4 of the California Mechanical Code.

### **3.02 HANGERS FOR DUCTS (SEE ALSO SECTION 230529)**

- A. Install hangers for ducts as specified in the CMC Chapter 6, Section 603.3, and as follows:
  - 1. For rectangular ducts up to 42 inches wide, supported from overhead construction, extend band hangers down over each side of the duct and turn under bottom of duct a minimum of 2 inches. Secure hanger to duct with three sheet metal screws, one in the bottom and two in the side of the duct.
  - 2. Support rectangular ducts larger than 42 inches wide with trapeze hangers or Tie Reinforcement as per SMANCA standards.
  - 3. For round and flat oval ducts, see drawings for arrangement, size hangers and braces as for rectangular ducts.

### **3.03 UPPER HANGER ATTACHMENTS**

- A. General:

1. Metallic fasteners installed with electrically operated tools may be used as upper hanger attachments, with the following exceptions:
  - a. Do not support a load, in excess of 250 pounds from any single anchor.
  - b. At areas with non-structural lightweight fill use Superstrut C-475 concrete insert welded to deck. Do not support a load in excess of 200 pounds from any single insert.

### **3.04 ADJUSTMENT AND CLEANING**

- A. Clean ductwork inside and out before grilles are installed and before fans are operated.

### **3.05 DUCT LINER**

- A. Install in accordance with SMACNA standards for the application of duct liner and the following.
  1. All portions of duct designated to receive duct liner shall be completely covered with liner. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. The black coated side of the liner shall face the air stream. Duct liner shall be adhered to the sheet metal with 100 percent coverage of adhesive, and all leading edges and all transverse joints coated with adhesive in accordance with ASC-7001C, Foster 85-60, Childers CP-127 or approved equal.
  2. Liner shall be additionally secured in accordance with SMACNA standards with mechanical fasteners which shall compress the duct liner sufficiently to hold it in place. Cut duct liner to assure overlapped and compressed longitudinal corner joints.
  3. Provide continuous sheetmetal edge protection nosings at entering and leaving edges of lined duct sections and all joints.
  4. Where duct liner is shown on drawings for ductwork exposed to outdoor temperatures, lining thickness shall be not less than 2 inch thick.
  5. Provide 2 inch thick duct liner on all supply air and return air ductwork exposed to outdoor temperatures.

### **3.06 FLEXIBLE FABRIC CONNECTORS**

- A. Make ductwork connections to air handling equipment with flexible fabric connectors. Install connectors so as to have sufficient slack to prevent vibration transmission.
- B. Secure fabric connectors to fans, casings and ducts as follows:
  1. Secure round connectors with No. 12 USS gauge x 1 inch wide galvanized steel draw bands. Secure bands with bolts and nuts.

2. Secure rectangular connectors with 1 inch x 1/8 inch thick flat galvanized steel bars, with screws or bolts on 8 inch centers maximum, or with sheet metal slip joints. Tightly crimp fabric into sheet metal joint and secure complete joint with sheet metal screws on 6 inch centers maximum.
- C. Fabric connectors may be factory pre-fabricated, pre-assembled units, with minimum No. 24 gauge metal edges, secured to fabric with double lock seams.
- D. Do not paint fabric connectors.
- E. Fabric connectors exposed to weather shall have a sheet metal shield to protect them from sunlight fastened to one edge of the connection.

**3.07 FLEXIBLE DUCT**

- A. Flexible Air Duct installation shall be in accordance with CMC Chapter 6, and length shall not exceed 10 ft. and angular deflection shall not exceed 135 degree with each turn not exceeding 90 degrees, or the minimum inside radius of one duct diameter, and not more than two bends per flexible duct.

**3.08 DAMPER HARDWARE**

- A. Provide all couplings, joints, screws, rods, linkages, etc., to complete the installation.

**3.09 SCHEDULE**

- A. See Air Distribution Device Schedule for type, size and code numbers of air outlets.

**END OF SECTION**

## **SECTION 26 01 00 – ELECTRICAL GENERAL REQUIREMENTS**

### **PART 1 – GENERAL**

#### **1.01 DESCRIPTION**

- A. Comply with the requirements of DIVISION 01.
- B. The requirements of this SECTION apply to all work of this DIVISION.
- C. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment, which is shown or listed, provide an item which will allow the system to function properly at no increase in the Contract Amount.

#### **1.02 QUALITY ASSURANCE**

- A. Related Work Specified Elsewhere:
  - 1. Refer to DIVISION 23 for all electrical wiring and equipment furnished under mechanical division but installed and connected under this division.
  - 2. Refer to DIVISIONS 10, 11, 12 and 14 for all electrical wiring and equipment furnished under architectural division but installed or connected under this division.
- B. Examination of the Site:
  - 1. Visit the site prior to bidding. If any of extra work due to discrepancies or omissions on the drawings if such omissions or discrepancies have been revealed by examination before bidding, the Contractor should report the discrepancy to the Architect a minimum of three days prior to receipt of bids. If additional work is required due to omissions and discrepancies after the contract for the work is signed and if such omissions or discrepancies would have been revealed by a visit to the site before receipt of bids, then the corrective additional work shall be performed at no additional cost to the Owner.
- C. Requirements of Regulatory Agencies:
  - 1. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the Architect for approval. If an

organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable testing and is approved by the Architect. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard.

2. Any specific reference in these Specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at date of submission of Bid, unless the Document is shown dated.
3. Perform the work in conformance with the applicable requirements of all regulatory agencies, including, but not limited to the following:
  - a. National Electrical Code.
  - b. Uniform Plumbing Code.
  - c. Uniform Building Code
  - d. California Code of Regulations (CCR).
    - (1) Title 8, Division 1, Chapter 3.2 - California Occupational Safety and Health Regulations (CAL/OSHA).
    - (2) Title 8, Division 1, Chapter 4 - Safety Orders.
    - (3) Title 24, Building Standards.
    - (4) Part 2 - California Building Code
    - (5) Part 3 - California Electric Code
    - (6) Part 4 - California Mechanical Code
    - (7) Part 5 - California Plumbing Code
    - (8) Acceptance Requirements of California Energy Code, including but not limited to:
      - (a) Testing of lighting control systems including all associated wiring devices and control components.
      - (b) Reviewing plans and specification to ensure conform to the Acceptance Requirements
      - (c) Perform construction inspection prior to testing to ensure that the equipment installed is capable of complying with the requirements of the Standards, the equipment is installed correctly and calibrated.

- (d) Undertake all required Acceptance Requirement procedures and identify all performance deficiencies, ensuring that they are corrected. Document the results of the Acceptance Requirement procedures on the Acceptance Test forms and indicate satisfactory completion by signing the Certificate of Acceptance.
- 4. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules, regulations.
- 5. When Drawings or Specifications exceed requirements of applicable laws, ordinances, rules, regulations, Drawings and Specifications take precedence.
- 6. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.
- 7. Work herein shall comply with all applicable requirements of CCR Title 8, Division 1, as they apply to this project, both in reference to Contractor's operations in performing his work and also in construction result to be accomplished. Where an omission or a conflict appears between OSHA requirements and the Drawings and Specifications, OSHA requirements shall take precedence.
- D. When there is an ambiguity or discrepancy between Drawings and Specifications the more stringent requirement of the two shall be provided.
- E. Licenses, Permits and Fees
  - 1. Provide, procure and pay for all permits, licenses, fees, etc., required to carry on and complete the Mechanical Work. Contact all applicable utility authorities and include in bid all fees, charged by any such authorities.
- F. Operating and Maintenance Instruction:
  - 1. Furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation.

The number of man-days (8 hours) of instruction furnished shall be two.

### 1.03 SUBMITTALS

- A. General



1. Submit shop drawings, catalog data, supplemental data, for all materials, equipment in all Sections of this DIVISION in accordance with the requirements of SECTION 013300, "Submittal Procedures" and as specified hereinafter.
  2. Four weeks after award of the Contract, or earlier it deemed appropriate by the Architect, submit a schedule of all submittals with the date for each equipment submittal or shop drawing submittal clearly indicated.
  3. Forward all submittals to Architect, together, at one time. Individual or incomplete submittals are not acceptable. Six (6) copies are required.
  4. Submittals shall have been reviewed and stamped by the General Contractor in accordance with the requirements of the GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION. Submittals not so stamped will be returned without review.
  5. The contractor shall allow for adequate time for submittal review by the engineer. In general, the contractor shall allow for a minimum of 15 working days from the day the general contractor sends the submittal to the architect to the day the architect returns the submittal to the general contractor. Additional time shall be allowed for large or complex submittals.
  6. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
  7. Identify each submittal item by reference to Specification SECTION Paragraph in which item is specified or drawing and detail number.
  8. Organize submittals in same sequence as they appear in specification sections, articles, or paragraphs.
- B. Indexing:
1. Submittals shall be indexed according to specification DIVISION and SECTION number and paragraph to identify each item. Sporadic submittals, incomplete data, or unidentified data, or data not showing features to coordinate item with other work will not be accepted.
- C. Binders: Prepare submittal material in accordance with the following:
1. Insert all literature in standard three (3) ring binders for 8-1/2 x 11 inch pages with individual tabs. Do not staple literature on different products together.
  2. Number all binders on the outside of the cover and indicate the specification section. Mark one binder "No. 1 Architect's Copy" and another "No. 2 Engineers Copy". Both these binders shall contain original manufacturer's literature.

3. Reference each item to the appropriate contract drawing sheet detail and to specification section and paragraph, and to the Mark Numbers appearing on the equipment schedule.
  4. Provide an index with each binder. This index shall follow the same sequence as the project Specifications.
- D. Submittal literature, Drawings and wiring diagrams shall be specifically applicable to this project and shall not contain extraneous material. The literature shall be clearly marked to indicate the proposed item and any accessories or options to be furnished. Submittals shall include, but not be limited to the following:
1. Floor boxes
  2. Supports and Anchors
  3. Electrical equipment, including but not limited to; transformers, switchboards, panelboards, motor control centers or control panels, electrical cabinets, multi-outlet assemblies, wiring devices, motor control disconnects and controllers, transient voltage surge suppressors, and lighting fixtures
  4. Overcurrent protective device coordination study, voltage drop and short circuit analysis
- E. Re-submittals shall respond to comments made on the original submittal and shall be marked with a re-submittal number and dated. Re-submittals not in conformance with these requirements will be returned without review.
- F. Shop Drawings: (Also see Division 01 requirements)
1. Submit shop drawings for lighting and audio-visual devices and equipment. Do not begin fabrication until shop drawings have been coordinated with all trades and have been reviewed and accepted by the Architect.
  2. Drawings shall be a minimum of 8-1/2 inches by 14 inches in size, with a minimum scale of 1/8 inch per foot, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, coordination plans with piping, ductwork, and other items that must be shown to assure a coordinated installation. Equipment and conduit routing layouts and Electrical Room layouts shall be drawn at a minimum scale of 1/4 inch per foot. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

3. The Architect's review of Shop Drawings is not intended to verify dimensions or quantities, or to coordinate items shown on these Drawings. Architect will review them for general conformance with design concept of the project and general compliance with the information given in the contract requirements of the plans and Specifications. Contractor is responsible for dimensions, which shall be confirmed and correlated at the job site, for fabrication processes and techniques of construction, for coordination of his work with that of all other trades and the satisfactory performance of his work.

G. Record Drawings

1. Installation drawings shall be drawn at the site by the Contractor on reproducible paper and shall be fully coordinated for interferences by all trades. The Contractor shall maintain at the jobsite a complete set of prints of the installation drawings for all mechanical work. These prints shall be kept up to date by recording all changes daily. The progress of the work shall be clearly, neatly and accurately designated, coloring in the various pipes, ducts and equipments as they are erected. This process shall incorporate all changes to the original drawings including formal change orders or other instructions issued by the Architect. Principal dimensions of all concealed work shall be recorded including inverts of buried conduits and height to underside of conduit racks or cable trays.
2. These marked up prints will be used as a guide for determining the progress of the work installed. They will be inspected monthly by the Architect and shall be corrected immediately if found either inaccurate or incomplete.
3. Prior to final acceptance of the Work of this Division, submit properly certified Record Drawings to the Architect for review and make changes, corrections, or additions as the Architect may require. After the Architect's review and any required Contractor revisions, deliver the Record Drawings to the Owner on electronic media in AutoCAD format. The Architect and Engineer do not assume any responsibility for the accuracy or completeness of the Record Drawings.

H. Operating & Maintenance Manuals:

1. Manuals shall conform to SECTION 017823, OPERATION AND MAINTENANCE DATA.
2. Furnish an operation and maintenance manual for each item of equipment. Furnish three copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed, and furnish the remaining manuals before the contract is completed. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local

representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation and shutdown; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shutdown instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

3. Submit a DVD disk containing all Operations and Maintenance data in Adobe "pdf" format. Also include an index of Internet web site addresses Section No. and title, equipment name, Web site address for the O&M manual of the equipment, and the O&M Manual filename.
  - I. Letters from manufacturers certifying their supervision of equipment installation and start-up procedures.
  - J. Three (3) copies of certification signed by Owner's representative, attesting to their receipt of instructions required by paragraph "Operation and Maintenance Instruction" of this Section.

#### **1.04 PRODUCT DELIVERY AND STORAGE**

- A. Identify materials and equipment delivered to site to permit check against approved materials list, reviewed shop Drawings.
- B. Protect from loss or damage. Replace lost or damaged material and equipment with new **at no increase in the Contract Amount.**

#### **1.05 DRAWINGS AND COORDINATION WITH OTHER WORK**

- A. Contract Drawings:
  1. For purposes of clarity, legibility, the Contract Drawings are essentially diagrammatic to extent that many offsets, bends, unions, special fittings are not shown. Exact locations of items are not indicated, unless specifically dimensioned.
  2. Exact routing of conduit, surface raceway, etc., shall be governed by structural conditions, obstructions. Contractor shall make use of data in Contract Documents. Architect reserves right, at no increase in price, to make any

reasonable change in location of mechanical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility. Verify Architect's requirements in this regard prior to roughing-in.

3. In addition to the Shop Drawings called for under SUBMITTALS the Contractor shall prepare large scale layout drawings showing location of equipment, piping and duct runs, and all other elements of mechanical systems provided under this DIVISION. Include sections of congested areas to show relative position and spacing of affected elements.
  4. Refer to the mechanical "M" and "P" series drawings and specifications, (Divisions 23 and 22 respectively) for the service voltage, power feed, control and interlock wiring for equipment specified under those sections. Review the documents to verify that the electrical services (power, control, interlock, etc.) provided are adequate and compatible with the equipment requirements. Include the cost to furnish and install the additional electrical services, if it is required over and above what is indicated on the mechanical "M" or "P" series drawings and in Division 26, such as additional control interlock conductors, larger feeder, or separate 120V control power source.
    - a. Prior to proceeding with the installation of any additional electrical work, submit detailed drawings indicating the exact scope of additional electrical work to the Architect for review and approval.
  5. Obtain and provide templates, information, and instructions to other DIVISIONS to properly locate holes and openings to be cut or provided for electrical Work.
  6. Not all offsets in surface raceway or conduit are shown. Decide which item to offset or relocate.
- B. Coordination:
1. Work out all "tight" conditions involving Work under this DIVISION and Work in other DIVISIONS in advance of installation.
  2. Maintain minimum 1 inch clearance from adjacent work, including piping, ductwork, insulation, etc. except as noted or approved.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two year use shall include applications of equipment and materials under similar circumstances and of similar size.

- B. Alternative Service Record: Products having less than a two-year field service record may be acceptable on approval of the Architect if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.
- C. Service Support: Major equipment items shall be supported by service organizations. The Contractor shall submit a certified list of qualified permanent service organizations for support of the equipment, which includes their addresses and qualifications. These service organizations shall be reasonably convenient to the equipment installation and able to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.
- D. Identify materials, equipment by manufacturer's name, nameplate data. Remove unidentified materials, equipment from site.
- E. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.
- F. Where no specific make of material or equipment is mentioned, any first class product of reputable manufacturer may be used, provided it conforms to requirements of system and meets acceptance.
- G. Equipment Guarding
  - 1. Equipment Safety:
    - a. High-temperature equipment and conduit (transformers, dimmer panels, etc.) so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders, and guardrails shall be provided where required for safe operation and maintenance of equipment.
- H. Equipment or material damaged during transportation, installation or operation is considered as totally damaged. Replace with new. Variance with this permitted only with written acceptance.
- I. Provide an authorized representative to constantly supervise work of this DIVISION, check all materials prior to installation for conformance with Drawings and Specifications.
- J. Equipment shall be as described in the respective SECTIONS of THIS DIVISION and as shown.

**2.02 SUBSTITUTIONS**

- A. See SECTION 016001, "SUBSTITUTION REQUEST" and the following.
- B. Where more than one specific name is used, it is to be understood that the name mentioned first represents the manufacturer whose equipment has been used as the basis of design. All other names mentioned are to be considered substitutions within the meaning of this paragraph, and no additional cost to the Owner shall accrue due to any revisions, additions or deletions required to make substituted equipment perform in accordance with the plans and specifications.
- C. Any redesign necessitated by substitutions shall be provided by the Contractor and shall be subject to review and approval by the Architect.
- D. Substitutions will not be considered if they are indicated or implied on Shop Drawings or Project Data Submittal without the formal request required by Division 01.

### **PART 3 – EXECUTION**

#### **3.01 DEMOLITION**

- A. Remove all conduit, fixtures, equipment, etc., where shown or otherwise indicated to be removed. Cap conduit at mains or source.

#### **3.02 INSTALLATION**

- A. Manufacturer's Recommendations
  - 1. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, printed copies of these recommendations shall be furnished prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
  - 2. Provide complete systems in accordance with manufacturers' requirements.
  - 3. Where dimensions or specific installation and operating instructions of equipment are not provided in the Drawings or Specifications, perform the Work according to approved manufacturer's specifications and recommendations. Any material and work required under this heading shall be supplied at no additional cost to the Owner.
  - 4. Assemble equipment which is required to be field assembled, under the direct supervision of the manufacturer's agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- B. Equipment: Accurately set and level with supports neatly placed and properly fastened. Properly fasten equipment in place with bolts to prevent movement in

earthquake. No allowance of any kind will be made for failure on part of Contractor to foresee means of bringing in or installing equipment into position inside building.

C. Conduit and channel support Systems:

1. Worked into complete, integrated arrangement with like elements to make work neat appearing, finished.
2. Run concealed, except as shown or noted otherwise; where exposed, run parallel with walls or structural elements; vertical runs plumb; horizontal runs parallel with structure and level or uniformly pitched as appropriate.
3. Install with adequate passageways free from obstructions, as high as practicable to maintain adequate head room, as shown or as required. Notify Architect before installation whenever head room of less than 7-feet 6-inches will result. Coordinate with work of other DIVISIONS to achieve proper head room as specified in this DIVISION.
4. Provide bases, piers, metal frames and backings, hangers and supports for the fixtures and systems furnished under this DIVISION.
5. Expansion and Contraction: Make adequate provisions, whether those provisions are shown on Drawings or not.
6. Cleaning and Closing: Inspect all conduit and surface raceway, and equipment before placing; clean interior before closing. Close all piping and ductwork at end of each day's work.

D. Sleeves, Chases, and Concrete Inserts:

1. Cutting and Patching: In accordance with SECTION 017329, "CUTTING AND PATCHING".
2. Provide, to cause no delay, all required sleeves, chases, inserts, anchor bolts, etc., and be responsible for correct location, installation of same.
3. Locating and sizing of openings for conduit or raceways through walls, etc., under this DIVISION. Framing of openings provided by respective DIVISIONS in whose work opening is made.
4. Penetrations of fire or smoke rated walls, partitions, and floors:
  - a. Pack space between conduit or cables and sleeve or opening with materials approved by Underwriters Laboratories for use in through-penetration fire stop systems. Materials, methods, and installation shall be in accordance with UL approved listings and shall be designed to act as a firestop as well as a cold smoke, noxious gas, and water sealant. Submit UL listings for all such systems to be used.
5. Conduit Sleeves: Where not otherwise indicated or specified, sleeves



through outside walls, floors or roof slabs shall be zinc-coated steel pipe conforming to ASTM A53. Sleeves through inside partitions shall be zinc-coated sheet steel not less than 0.0217-inches thick conforming to ASTM A653.

- E. Cutting and Repairing:
  - 1. Do all cutting, repairing, including structural reinforcing, necessary for Work under this DIVISION.
  - 2. Do no cutting or patching without Architect's review. Repair damage done by this cutting equal to original condition in Architect's opinion.
  - 3. Assume responsibility for all damage to any part of premises or Work of other DIVISIONS, caused by leaks or breaks in piping or equipment furnished and/or installed under this DIVISION during construction and guarantee period.

### **3.03 TESTING AND OPERATIONAL CHECK**

- A. Furnish all labor and test equipment required under this DIVISION and in accordance with SECTION 266000 and as follows.
- B. Clean equipment and conduit before each test.
- C. Test various Electrical systems in portions as work progresses. Any system or portion previously tested shall become part of any repeated test when it becomes part of distribution system.
- D. Should any piece of equipment or material fail in any of the tests, immediately remove, replace with new; retest system.
- E. Maintain test pressures for periods stated, or as directed without loss in pressure, except that due to change in temperature or atmospheric pressure during test.
- F. Perform all tests in accordance with the requirements and under supervision of authorities having jurisdiction.
  - a. All equipment shall be tested in the field by a company specializing in the specific equipment. Provide a written report upon completion of testing indicating final condition and setting(s) of each piece of equipment.

### **3.04 FIELD TESTING – GENERAL**

- A. Tests:
  - 1. Perform as specified in individual sections and as required by authorities having jurisdiction.

2. Duration as noted.
3. Provide testing in accordance with NETA requirements.
- B. Provide required labor, material, equipment, instruments, and connections.
  1. Provide adequate number of technicians thoroughly familiar with systems to be tested to manage test procedures and assignments.
  2. Provide calibrated instruments, tools, and equipment for verification and adjustment, including adequate number of portable two-way radio communication equipment.
- C. Pay for restoring or replacing damaged work due to tests.
- D. Conducted by installer and equipment manufacturer or by approved testing agency where stated.
- E. Preliminary Tests: After work is completed, conduct preliminary tests to verify that installations are properly adjusted and free from defects.
- F. Final Tests: After completion of preliminary tests, conduct final tests to cover total systems throughout building. Tests to prove continuity and proper operation of entire installation of each system.
- G. Preparations:
  1. Give 14 days written notice before final tests. Coordinate dates and times with Owner.
  2. At time of notice, submit for review charts, lists, and schedules listing each circuit and item in each system for recording of values and check-off during tests.
- H. Submit test results in accordance with submittal requirements.
- I. In addition to specific systems testing described elsewhere include the following tests:
  1. Insulation resistance.
  2. Circuit continuity:
  3. Test all feeder and branch circuits for continuity.
  4. Test all neutrals for improper grounds.
  5. Test motors for proper rotation and operation.
  6. Alarm systems: Test failure and trouble modes for proper system response. See other sections.

- 7. Circuit numbering verification: Select at random basis branch circuit breakers. Cycle on-off to verify panel directory matches actual load controlled.
- J. Approved Testing Agency: Electro Test Inc. Power Systems Inc., or approved equal.

**3.05 CLEANING AND PAINTING**

- A. Refinish Work supplied with final finish under this DIVISION if damaged to satisfaction of Architect.
- B. thoroughly clean all equipment, conduits and all other materials under this DIVISION free from all rust, scale, and all other dirt before covering or painting is done, or the systems put in operation. Leave in condition satisfactory to the Architect.
- C. Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.
- D. At all times keep the premises free from accumulation of waste material and debris caused by his employees. At the completion of the project, remove refuse from within and around the building. All tools, scaffolding and surplus materials shall also be removed, leaving the site of his Work broom clean.
- E. Completely cover all electrical equipment to keep free of dirt and water during construction. Using visqueen, or other suitable material, effectively cap all openings into equipment to keep foreign matter out during construction.
- F. Torque and paint bolt heads in all equipment at completion of Work. Furnish Owner with a written torque schedule for all equipment.
- G. Properly prepare Work under this DIVISION to be finished painted under SECTION 099000, "PAINTING AND COATING".
  - 1. All exposed work which in general includes conduit, surface raceway, channel supports, metal items, equipment and supports shall be painted except that polished aluminum, stainless steel, chrome plate and other finely finished materials shall not be painted unless otherwise noted.
  - 2. Unless otherwise noted all finish colors shall be selected by the Architect.
  - 3. Materials previously shop prime coated by the manufacturer and which have been scuffed or otherwise damaged shall be touched up with the same materials used for priming. Prime coats shall be of a lighter tint than final coats.

**3.06 SIGNS, LABELS AND IDENTIFICATION**

- A. Signs and Labels:

1. Fasten a red-headed tack to each T-bar suspended ceiling pushout tile at any equipment, component or control devices, requiring maintenance or access.
  2. A printed sign shall be posted at alarm equipment. Provide proposed wording prior to fabrication.
  3. A printed sign shall be posted at each automatically started equipment stating, "WARNING THIS MACHINE IS AUTOMATICALLY CONTROLLED AND MAY START AT ANY TIME".
- B. Conduit Identification:
1. Identify and color-code all conduit including conduit in furred ceiling spaces. Identification shall be as specified herein.
  2. Plastic Markers: Seton Setmark, or equal, for concealed locations or if located in electrical rooms; or Seton Opticode, or equal, for exposed conduits in public areas, with wording as selected by the Architect. Each marker must show approved color-coded background, proper color of legend in relation to background color, approved legend letter size, and approved marker length.
  3. Location for Conduit Identification:
    - a. Adjacent to each panel or junction box fitting
    - b. At each branch and riser take-off.
    - c. At each conduit passage through wall, floor and ceiling construction.
    - d. On all horizontal runs spaced 25-feet maximum but not less than one per room.

### **3.07 EQUIPMENT IDENTIFICATION**

- A. Properly identify each piece of equipment and its controls using engraved laminated plastic descriptive nameplates, attached to equipment and controls using round head brass machine screws or pop rivets. Cardholders in any form are not acceptable. Equipment nameplates shall be as shown on drawings.
- B. Wiring devices shall be provided with engraved nameplates indicating the panel and circuit number. Text color shall be black unless directed otherwise by Architect. Text height shall be minimum 1/8" high.

### **3.08 SEISMIC REQUIREMENTS**

- A. Contractor shall engage and pay for services of a California Registered Structural Engineer for the purpose of design and follow-up field verification of seismic anchoring for:
  1. Distribution panels and switchboards.
  2. Typical panelboards (wall mounted).

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3. Typical multiple conduit racks and tray supports.
- B. Details shall be submitted to the Architect for records only. Design shall be in accordance with UBC, Chapter 23, Section 2312. Verify with Structural Engineer.

**END OF SECTION**

**SECTION 26 05 19 – LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

**PART 1 – GENERAL**

**1.01 GENERAL REQUIREMENTS**

- A. Refer to 260100, Basic Electrical Requirements
- B. All materials shall bear the listing label of Underwriters Laboratories.

**1.02 SUBMITTALS**

- A. Manufacturers' product data sheets.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. AFC Cable Systems
- B. Allied Wire and Cable
- C. American Insulated Wire
- D. Cerro Wire
- E. General Cable
- F. Prysmian
- G. Pyrotenax
- H. Southwire

**2.02 CONDUCTORS**

- A. All conductors shall be solid or stranded copper and installed as identified and specified.
- B. All wire sizes shown on the Drawings are copper.

**2.03 INSULATION**

- A. Type THHN, THWN, XHHW (75 degrees C): Type XHHW shall be used in below grade and damp locations.

- B. Type AF (150°C) Fixture Wire: Minimum size No. 14, stranded, high temperature wire shall be used for field wired tap-off connections to lighting fixture where operating temperature exceeds 90°C.
- C. Special types of wiring such as coaxial cables, microphone cable and other multi-conductor cables shall be as specified elsewhere and as indicated.
- D. Type MC (90°C): Use for branch circuit wiring from ceiling junction box to switch or receptacle (not permitted for branch circuit homeruns). The conductors shall be color coded to match coding as described herein. Fittings for connection of Type MC cable to boxes, cabinets, etc., shall be fitting type E.T.P. Series AMC or acceptable equivalent.

**2.04 IDENTIFICATION**

- A. Color code all wiring throughout including branch circuits, feeders, multiconductor cables, fire alarm system, equipment ground conductors, etc., as specified hereinafter and as indicated.

	120/208	277/480
<u>Phase</u>	<u>Volts</u>	<u>Volts</u>
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	White
Ground	Green	Green
Isolated Ground	Green/Yellow Stripe	

- B. Switch legs for local wall switches shall be same color as phase wires.
- C. Colored insulation in sizes up through No. 8. Conductors No. 6 and larger shall have black insulation but phase color coded with 1/2 inch band of colored tape, at all junction boxes, pull boxes, wireways, and terminations.
- D. Main and feeder cables shall be tagged in all pull boxes, wireway, and wiring gutters of panels. Tags shall be of fireproof, nonconductive material, approved by Architect.
- E. Maintain the same phase, neutral and ground color from circuit breaker or switch to last device.

**2.05 PULL CORD**

- A. Branch and System Raceways: Provide 300 lbs strength (minimum) polypropylene rope.

- B. Feeder Raceways: Provide 1/4 inch (minimum) polypropylene rope.
- C. Both ends of all pull cords shall be identified by means of labels or tags, reading "PULL CORD" and shall be numbered to refer to the same pull cord at each end.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION**

- A. All conductors shall be solid or stranded for branch circuit lighting and receptacle wiring. Use stranded conductors for branch circuit wiring to motors or vibrating equipment.
- B. A complete system of conductors shall be installed in the raceway system throughout the building for all feeder and branch circuits, etc.
- C. All conductors shall be continuous from outlet to outlet and no splices shall be made except within outlet or junction boxes. Junction boxes may be utilized where required. At least 6 inches of wire shall be left at outlet boxes for connecting fixtures and devices.
- D. No wire smaller than No. 12 gauge shall be used, except for signal or control systems, or where otherwise indicated. No. 10 wire shall be used for 120 volt branch circuit runs exceeding 70 feet, and 160 feet for 277 volt, for all exit light wiring, and elsewhere when noted on the plans.
- E. Parallel Feeders: Each phase wire and neutral wire of each parallel run shall be the same length.
- F. Wires entering switchboards, panelboards, and disconnects shall be of sufficient length for proper termination without splicing within the equipment enclosure. Any wires installed that require splicing for terminating shall be removed and replaced with ones of the proper length. Wires shall be trained and supported in a neat and workmanlike manner.
- G. Wiring Bundles or Harnesses:
  - 1. Multiple wires in bundles or harnesses terminating in control panels, switchboards, panelboards, etc., shall be bundled, trained, and laced to achieve a neat and workmanlike appearance.
  - 2. Surplus wire protruding from the harness for termination shall be trimmed to the proper length. Do not fold and stuff surplus wires into wiring gutters.
  - 3. Wires exiting the bundle or harness shall be carefully trained at a 90° angle to the termination point.
- H. Phase Rotation:



1. The Contractor shall check with the power company serving the facility to determine that the phase rotation on the primary side of the building service transformer is clockwise, A-B-C, left-to-right. Coordinate phase rotation between power company and emergency engine-generators.
  2. This phase rotation shall be maintained throughout the facility including wiring for switchboards, substations, panelboards, motor control centers, and transformers (both primary and secondary).
  3. Prior to Final Closeout of the Project, the Contractor shall furnish a certificate to the Architect stating the above has been accomplished.
- I. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing and shall not be older than 12 months.
  - J. Type MC cable shall be installed in compliance with NEC Article 300. Support for MC cable shall be within 6 feet of every outlet box, junction box, cabinet, or fitting. Maximum distance between horizontal supports shall be 6 feet.

### **3.02 CONNECTIONS**

- A. Connections to circuit breakers, switches, and similar equipment provided with lugs or connectors may be used without additional lugs or connectors; where equipment is provided without terminating devices. Contractor shall provide appropriate devices which are listed and manufactured for such application.
- B. Splices:
  1. No. 8 and smaller wire shall be Scotchlock or approved equal, pressure type solderless connectors with insulator.
  2. No. 6 and larger wire shall be Burndy, Type QPX, or approved equal, solderless lugs and clamp-type connector.
    - a. Uninsulated solderless connectors shall be insulated as follows: Wrap with two complete thicknesses of varnish cambric followed by 6 complete wraps of Scotch 33 or equal, followed by 1 complete wrap of Scotch 2200.
- C. Control Wires:
  1. Control wires shall terminate into a terminal block or lug connection. Wires shall be stripped to the proper length and a ring or tongue crimp-on terminal lug installed.
  2. Do not wrap bare wires around bolt heads for termination.
  3. Stranded wires terminating into terminal blocks or lugs and secured by means of a set screw shall have the wire end tinned with solder to achieve a positive connection and anneal the strands together.

- D. Conductors subject to moisture. Use 3M Scotchcast splicing kits for power signal or control conductor splices.

**3.03 LUBRICATION**

- A. Where lubrication is required for pulling conductors or cables, it shall be a compound specifically prepared for cable pulling and shall not contain petroleum or other products which will have a deteriorating effect on the cable insulation.

**3.04 COMMISSIONING**

- A. Refer to Sections 260800 COMMISSIONING OF ELECTRICAL SYSTEMS, and 260500, COMMON WORK RESULTS FOR ELECTRICAL for system commissioning requirements.

**END OF SECTION**

**SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

**PART 1 – GENERAL**

**1.01 GENERAL REQUIREMENTS**

- A. Refer to Section 260500: Common Work Results for Electrical.

**1.02 WORK INCLUDED**

- A. The electrical grounding work shall include, but not necessarily be limited to, the following as defined in Article 250 of NEC:
  - 1. Electrical circuit and system grounding:
    - a. Service supplied AC systems.
    - b. Separately derived AC systems including transformers, UPS systems, power conditioners, standby or emergency generators, etc.
  - 2. Electrical enclosure and raceway grounding.
  - 3. Equipment grounding.
  - 4. Bonding.
- B. Equipotential grounding of building structure.
- C. Zero Signal Reference Grid for computer/data processing rooms.

**1.03 RELATED WORK**

- A. Section 260500: Common Work Results for Electrical.
- B. Section 266000: Field Test and Operational Check.

**1.04 REFERENCED STANDARDS**

- A. In addition to NFPA No. 70-NEC, and NFPA No. 101 - Life Safety Code conform to the following standards, latest edition:
  - 1. UL Standard 467 - Electrical Grounding and Bonding Equipment.
  - 2. UL Standard 1053 - Ground-Fault Sensing and Relaying Equipment.
  - 3. IEEE Standard 142.
  - 4. Federal Information Processing Standard (FIPS) No. 94.

- B. Where drawings or specifications require a more stringent material or method than the above mentioned standards conform to the drawings and/or specifications.

## **PART 2 – PRODUCTS**

### **2.01 GROUND RODS**

- A. Copper clad steel rod conforming or exceeding requirements of UL Standard No. 467. Rod shall be 3/4" diameter, 10' in length.
- B. In corrosive soil locations: Stainless steel (302) or stainless steel jacketed steel rod conforming or exceeding requirements of UL Standard No. 467 (ANSI C-33.8) as manufactured by Teledyne Metals Forming Company, Elkhart, Indiana. Rod shall be 3/4" diameter 10' in length.

### **2.02 CONDUCTORS FOR GROUNDING**

- A. In raceways installed with circuit conductors: Size and insulation shall be as specified in Section 16050 or on drawings.
- B. Grounding electrode conductors: Medium hard drawn, stranded copper. Minimum size: #4/0 AWG.
- C. Bonding conductors: NEC Article 250, Part G.

### **2.03 GROUND CONNECTIONS**

- A. Below Grade: Exothermic welding method, Cadweld or equal.
- B. Above Grade of in Manholes: Compression type connectors, T&B, Burndy or Anderson.

### **2.04 HARDWARE**

- A. Bolts, nuts, and washers shall be bronze, cadmium plated steel, or other non-corrosive material, approved for the purpose.

### **2.05 WATERPROOF SEALANT**

- A. Use Kearney "Aqua Seal" mastic sealant on all below grade clamp or compression type connections.

## **PART 3 – EXECUTION**

### **3.01 GROUNDING ELECTRODE SYSTEM**

- A. Grounding electrode system shall consist of the following electrodes:
  - 1. Metal underground water pipe.
  - 2. Building structural metal columns grounded as detailed on drawings.
  - 3. Concrete-encased electrodes (UFER Ground) as detailed on drawings.
  - 4. Ground rods.
- B. The above grounding electrodes shall be connected together to form a grounding electrode system. See drawings for additional details.

### **3.02 CIRCUIT AND SYSTEM GROUNDING**

- A. Direct-current systems and service-supplied and separately derived alternating-current systems shall be grounded in accordance with NEC 250-3 to 250-26 inclusive.
- B. Ground conductor shall be copper and shall be in accordance with NEC 250-94.

### **3.03 ELECTRICAL EQUIPMENT GROUNDING**

- A. Ground non-current carrying metal parts of electrical equipment enclosures, frames, conductor raceways or cable trays to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together. Install a ground conductor in each raceway system in addition to conductors shown.  
  
Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per NEC 250-95 unless larger conductors are shown on drawings.
- B. Grounding conductors shall be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation shall be used and suitably identified with green tape at each junction box or device enclosure.
- C. Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knock-outs.
- D. Lighting fixtures shall be securely connected to equipment ground conductors. Outdoor lighting standards shall have a factory installed ground lug for terminating the ground wire.
- E. Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.
- F. UFER Ground: Form a continuous ground mat by serpentine bare copper conductor of minimum length 60 feet in the bottom of the structure foundation footing. The maximum resistance of the ground mat shall not exceed 5 ohms under normally dry

conditions. If this ground resistance cannot be obtained with the 60 feet of conductor, additional conductor shall be added.

- G. All ground connectors shall be bronze of the clamp type. All clamp accessories such as bolts, nuts, and washers shall also be bronze to assure a permanent corrosion-resistant assembly. Connector shall be as manufactured by Burndy Engineering Company, IlSCO Corporation, or approved equal.
- H. All ground cable splices, joints, building structural steel, and connections to ground rods shall be made with an exothermic welding process which shall provide a weld with current-carrying capacity not less than that of the conductors welded. Soldered connections shall not be used.
- I. All ground wire shall be bare, unless otherwise indicated on the Drawings, extra flexible stranded copper cables. Grounding cables installed in earth shall be laid slack.
- J. Neutrals throughout the system shall be solidly grounded.
- K. Lighting and power panelboard shall be grounded by connecting a bare conductor to the grounding stud and to the incoming and outgoing feeder conduits grounding bushings. Each grounding-type bushing shall have the maximum ground wire accommodation available in standard manufacture for the particular conduit size. Connection to the bushing shall be with wire of this maximum size.
- L. The grounding stud of each secondary voltage dry type, 3-phase transformer shall be connected separately to the grounding lug on the panelboard serving the transformer utilizing a ground clamp for such transformers specified below. Connection shall be by means of an insulated conductor run in rigid steel conduit, sized as shown on the Drawings.
- M. The central equipment for the fire protection alarm system shall have its grounding terminal connected to the ground lug on the panelboard serving the system by means of a #6 green coded insulated conductor, run in 3/4 inch rigid steel conduit, utilizing a ground clamp.
- N. Grounding connections to switchboards and distribution panelboards shall be by using a compression type lug bolted directly to the ground bus for each grounding conductor terminated.

### **3.04 BONDING**

- A. Bonding shall be provided to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed.
- B. Bonding shall be in accordance with NEC Article 250, Part G.

**3.05 ISOLATED/INSULATED GROUND FOR ELECTRONIC EQUIPMENT AND/OR INSTRUMENT**

- A. Provide a ground grid and insulated conductors into the building where shown to form the Isolated/Insulated Ground System for Electronic Equipment and/or Instrument.
- B. Provide grounding bars, outlets and/or jacks as shown and detailed on drawings.
- C. Isolated Equipment Grounding System Installation
  - 1. The isolated ground receptacle branch circuits shall require a separate neutral and isolated grounding conductor. A single equipment grounding conductor shall also be installed for grounding the raceway system (this conductor can be a common conductor for 2 or 3 branch circuits within the same raceway).
  - 2. The isolated ground receptacle grounding screw shall be grounded by extending an isolated grounding conductor with the circuit conductors to the serving panelboard. At the panelboard connect the isolated grounding conductors to an isolated ground bar (insulated) from the panelboard metal housing. From the isolated ground bar extend a green wire with yellow strip (same size as the equipment grounding wire) back to the equipment grounding terminal of the derived system or service. This conductor shall be routed through the distribution system without connection until it terminates at the derived system or service point.

**3.06 COMMISSIONING**

- A. Refer to Sections 260800, COMMISSIONING OF ELECTRICAL SYSTEMS, and 260500, COMMON WORK RESULTS FOR ELECTRICAL for system commissioning requirements

**3.07 TESTING**

- A. Refer to Section 266000, FIELD TEST AND OPERATIONAL CHECK, for system testing requirements.

**END OF SECTION**

## **SECTION 26 05 29 – SUPPORTS AND ANCHORS**

### **PART 1 – GENERAL**

#### **1.01 GENERAL REQUIREMENTS**

- A. Multi-outlet supports.
- B. Raceway supports.
- C. Conduit supports.

#### **1.02 WORK INCLUDED**

- A. Refer to SECTION 260100: Basic Electrical Requirements

### **PART 2 – PRODUCTS**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Supports:
  - 1. OZ/Gedney
  - 2. Appleton
  - 3. Thomas and Betts
  - 4. Minerallac
  - 5. Midwest Electric
  - 6. Unistrut
  - 7. B-Line
  - 8. Kindorf
  - 9. Super Strut
  - 10. Erico Products (Caddy)
- B. Anchors:
  - 1. Hilti
  - 2. Red Head
  - 3. Raw Plug
  - 4. Star Expansion



## 2.02 METAL SURFACE RACEWAYS AND MULTIOUTLET ASSEMBLIES

### A. Fasteners and Supports:

1. Wood: Flat-head wood screw.
2. Dry Wall: Plastic anchor with flat-head wood screw.
3. Plaster: Plastic anchor with flat-head sheet metal screw.
4. Brick, Masonry or Block: Masonry nail.
5. Tile: Toggle bolt.
6. Concrete: Drive pin fastener.

## 2.03 CONDUIT

### A. Single Conduit:

1. Supported from beam flange:
  - a. Beam Clamp:
    - (1) Appleton No. BH500 for conduit 1 inch and smaller.
    - (2) Appleton No. BH502 for conduit 1-1/4 inches and larger.
  - b. Conduit Hanger: Zinc-plated steel with bolt and nut, Minerallac No. 0-B through 10-B as required.
  - c. Support: Machine screw between clamp and hanger.
2. Supported and suspended from beam flange:
  - a. Beam Clamp:
    - (1) Appleton No. BH500 for conduit 1 inch and smaller.
    - (2) Appleton No. BH502 for conduit 1-1/4 inches and larger.
  - b. Conduit Hanger: Zinc-plated steel with bolt and nut, Minerallac No. 0-B through 10-B as required.
  - c. Rod: Zinc-plated or galvanized steel, threaded, Minerallac.
    - (1) 1/4 inch diameter for conduit 1 inch and smaller.
    - (2) 3/8 inch diameter for conduit 1-1/4 inches and larger.
  - d. Support:
    - (1) Nut on rod on both the inside and outside of the clamp; outside nut to act as locking nut.
    - (2) Nut on rod on inside of hanger.

3. Supported from concrete slab or roof:
    - a. Support: One-hole strap, Minerallac MIN-E snap-on clip.
    - b. Concrete Insert: Phillips Redhead, 'J' or 'S' Series.
  4. Supported and suspended from concrete slab or roof:
    - a. Conduit Hanger: Zinc-plated steel with bolt and nut, Minerallac No. 0-B through 10-B as required.
    - b. Rod: Zinc-plated or galvanized steel, threaded, Minerallac.
      - (1) 1/4 inch diameter for conduit 1 inch and smaller.
      - (2) 3/8 inch diameter for conduit 1-1/4 inches and larger.
    - c. Support: Nut on rod on inside and outside of hanger.
    - d. Concrete Insert: Phillips Redhead, 'J' or 'S' Series.
  5. Supported from concrete, or hollow masonry wall:
    - a. Conduit Hanger: Two-hole heavy-duty strap, Minerallac 200 Series.
    - b. Anchor:
      - (1) Concrete: Phillips Redhead, 'J' or 'S' Series.
      - (2) Masonry Wall: Molly bolt.
  6. Supported from damp or outside concrete wall:
    - a. Conduit Hanger: Zinc-plated steel with bolt and nut, Minerallac No. 0-B through 10-B as required.
    - b. Anchor: Phillips Redhead, 'J' or 'S' Series.
- B. Multiple Conduits:
1. Supported from concrete slab or roof:
    - a. Support: One-hole strap, Minerallac MIN-E snap-on clip.
    - b. Concrete Insert: Phillips Redhead, 'J' or 'S' Series.
  2. Supported and suspended from concrete slab or roof:
    - a. Conduit Hanger: Unistrut pipe clamp No. P1100 Series for rigid and No. P1200 Series for EMT.
    - b. Rods (2 required): 3/8 inch diameter.
    - c. Support:

- (1) Unistrut No. P-1000, length as required.
    - (2) Nut on rod on outside of unistrut and unistrut spring-loaded nut on inside of unistrut.
  - d. Concrete Insert: Phillips Redhead, 'J' or 'S' Series.
- 3. Supported from metal deck:
  - a. Conduit Hanger: Zinc-plated steel with bolt and nut, Minerallac No. 0-B through 10-B as required.
  - b. Anchor in Deck: Fender washer with nut.
- 4. Supported from concrete or hollow masonry wall:
  - a. Conduit Hanger: Unistrut pipe clamp No. P1100 Series for rigid and P1200 Series for EMT.
  - b. Support: Unistrut No. P-1000, length as required.
  - c. Anchor:
    - (1) Concrete Insert: Phillips Redhead, 'J' or 'S' Series.
    - (2) Masonry Wall: Molly bolt.

## **2.04 SUBMITTALS**

- A. Manufacturer's product data.

## **PART 3 – EXECUTION**

### **3.01 CONDUIT SUPPORTS**

- A. Support Horizontal Conduit as Follows:
  - 1. Rigid, intermediate conduit and EMT shall be supported no greater than every 10 feet. Flexible conduit and MC cable shall be supported no greater than every 4.5 feet.
- B. Rigid galvanized steel and EMT shall be supported within 3 feet of every outlet box, junction box, cabinet, or fitting. Flexible conduit shall be supported within 1 foot.
- C. Support vertical conduit at every floor with a maximum of 10 feet between supports.
- D. Conduit systems shall be designed for maximizing deflection not greater than 1/8".

### **3.02 SLEEVES**

- A. Provide conduit sleeves for every fire-rated wall or floor where conduit penetrates.

**3.03 ANCHORS**

- A. Anchors shall be installed using the proper drill bits and power tools.
- B. Anchors shall be installed per the manufacturer's recommendations.

**3.04 COMMISSIONING**

- A. Refer to SECTION 260800, Commissioning of Electrical Systems, and SECTION 260100, Basic Electrical Requirements, for system commissioning requirements.

**END OF SECTION**

**SECTION 26 05 33 – CONDUIT RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 – GENERAL**

**1.01 GENERAL REQUIREMENTS**

- A. Galvanized rigid steel conduit (GRC).
- B. Plastic coated rigid steel conduit.
- C. Intermediate metal conduit (IMC).
- D. Electrical metallic tubing (EMT).
- E. Nonmetallic conduit.
- F. Flexible metal conduit.
- G. Liquid tight flexible metal conduit.
- H. Outlet boxes.
- I. Junction boxes.
- J. Pull boxes.

**1.02 SUBMITTALS**

- A. Manufacturer's product data.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS - CONDUIT**

- A. Conduit (GRC, IMC, EMT):
  - 1. Triangle
  - 2. Wheatland
  - 3. Allied
  - 4. Western
- B. Plastic Coated Rigid Steel:
  - 1. Robroy

- C. Conduit (Nonmetallic):
  - 1. Carlon
  - 2. Anamet]
  - 3. P-W Pipe
- D. Flexible Metal Conduit:
  - 1. AFC
  - 2. Anamet
  - 3. Alflex
- E. Liquid-tight Flexible Metal Conduit:
  - 1. Anamet
  - 2. Electri-flex
  - 3. Wheatland
- F. Fittings:
  - 1. Crouse-Hinds
  - 2. Appleton
  - 3. Steel City
  - 4. T&B
  - 5. ETP
  - 6. Midwest Electric
  - 7. Oz/Gedney

**2.02 ACCEPTABLE MANUFACTURERS - BOXES**

- A. Steel:
  - 1. Steel City
  - 2. Appleton
  - 3. Raco
  - 4. Bowers
  - 5. Hoffman
  - 6. Circle AW Products

- 7. E.M. Wiegmann
- B. Malleable Iron:
  - 1. Appleton
  - 2. Crouse-Hinds
  - 3. Killark
  - 4. Oz/Gendey

**2.03 CONDUIT TYPES**

- A. GRC:
  - 1. Conduit: Standard I.P.S., hot-dipped galvanized or sheradized steel with galvanized threads. Zinc coating.
  - 2. Fittings:
    - a. Threaded galvanized malleable iron or heavy steel water and concrete tight.
    - b. Metallic nylon grounding type insulated bushings with locknuts for all connectors at cabinets, boxes, and gutters.
    - c. Set screw connectors are not acceptable.
    - d. Die-cast fittings shall not be used.
  - 3. Bushings and Locknuts: Malleable iron with sharp, clean cut threads.
- B. Plastic-coated Rigid Steel:
  - 1. Conduit:
    - a. Hot-dip galvanized including hot dip galvanized threads.
    - b. Zinc surface prior to plastic coating to be conditioned to provide anchor for the plastic coating.
    - c. Interior and exterior to be coated with lacquer, such as an epoxy acrylic, prior to application of plastic coating.
    - d. Plastic coating to be applied by dip method.
    - e. Plastic coating to be factory applied by same manufacturer who produces the hot dip galvanized conduit.
    - f. Plastic coating to have minimum thickness of 0.040 inches the full length of the pipe except for the threads.





- b. Set-Screw Type for Interior Dry Locations:
    - (1) Connectors: Steel, zinc electroplate, nylon insulated, concrete tight, T&B No. 5031 Series, Crouse-Hinds No. MW1450 Series, or approved equal.
    - (2) Couplings: Steel, zinc electroplate, concrete tight, T&B No. 5030 Series, Crouse-Hinds No. 460 Series, or approved equal.
    - (3) Combination Couplings: Steel, zinc electroplate, concrete tight, T&B No. 480 Series, Crouse-Hinds No. MW420 Series, or approved equal.
  - c. Die cast, pressure cast, or indenter type fittings shall not be used.
  - d. Other applicable fittings as specified for GRC or as approved.
- E. Flexible Metal:
- 1. Conduit:
    - a. Flexible steel conduit, formed on 1 continuous length of electro-galvanized spirally wound steel strip.
    - b. Not to exceed 6'-0" in length for lay-in fixtures.
    - c. Not to exceed 4'-0" for motors.
    - d. Aluminum flexible conduit shall not be used.
  - 2. Fittings:
    - a. Clamp-type utilizing 1 set screw 3/8 inch through 1 inch size, 2 set screws 1-1/4 inch and larger, galvanized malleable iron or steel with nylon insulated throat.
    - b. O.Z. Gedney KC series or approved equal.
- F. Liquid-tight Flexible Metal:
- 1. Conduit:
    - a. Liquid-tight flexible steel conduit, formed of one continuous length of electro-galvanized spirally wound steel strip, with neoprene jacket. Conduit 1-1/4 inch and smaller, shall contain a built-in continuous copper ground.
    - b. 4'-0" maximum length.
  - 2. Fittings:

- a. Galvanized malleable iron or steel, liquid-tight with neoprene gaskets, "O" ring and retainer, nylon insulated throats and external grounding lug.
  - b. Appleton No. 4Q-TL series or approved equal.
- G. Rigid Nonmetallic:
- 1. Conduit:
    - a. Rigid polyvinyl chloride (PVC) Schedule 40 as noted on the Drawings.
    - b. Provide in standard lengths of 10 or 20 feet.
  - 2. Fittings:
    - a. Factory made.
    - b. Horizontal elbows may be rigid nonmetallic.
    - c. Approved couplings for joining plastic to steel shall be used for connection to GRC elbows or raceways.

#### **2.04 OUTLET BOXES, JUNCTION AND PULL BOXES - REQUIREMENTS**

- A. Boxes must conform to the provisions of Article 370 of the NEC.
- B. Boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Boxes shall not be less than 4 inches square and 1-1/2 inches deep unless otherwise noted.

#### **2.05 CONSTRUCTION**

- A. Boxes generally shall be hot-dipped galvanized steel with factory-made knockout openings.
- B. Boxes on exterior surfaces, in floors, on stub-ups above floors, or in wet or damp locations shall be corrosion-resistant cast malleable iron. Boxes shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Type FS or FD.
- C. Conduit bodies shall be corrosion-resistant cast malleable iron. Bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers.
- D. Conduits terminating in boxes, cabinets, panelboards, etc., with eccentric or concentric knockouts, shall have a grounding bushing installed and bonded to the box by means of a bond wire from the bonding bushing lug to a lug on the enclosure.

#### **2.06 TYPES**

- A. Outlet Boxes:

1. Deep boxes shall be used:
    - a. In walls covered by wainscot or paneling.
    - b. In walls of glazed tile, brick, or other masonry which will not be covered with plaster. The bottom of the box shall be located on the horizontal joint. Box shall be listed for particular application.
  2. Thru-the-wall-type boxes shall not be used unless specifically called for.
  3. Boxes shall be nongangable.
  4. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars, and shall be of the type approved for concrete use. Boxes installed in poured concrete shall be packed with a material to avoid concrete from entering the box during the pour.
  5. Lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.
  6. Light, switch, receptacle, and similar devices shall be provided with approved boxes, suitable for their function.
  7. Back boxes shall be furnished and installed as required for the equipment and/or systems under this contract.
- B. Pull and Junction Boxes:
1. Shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle iron framing where required.
  2. Shall have a blank cover in unfinished areas and a plaster ring and blank cover in finished areas.
  3. Shall have their covers accessible. Covers shall be fastened to boxes with machine screws to insure continuous contact all around. Covers for surface-mounted boxes shall line up evenly with the edges of boxes. Covers for flush-mounted boxes shall extend 3/4 inch past boxes all around.
  4. Boxes with unused punched out openings shall have the openings filled with factory-made knockout seals.
  5. Where 120 volt and 277 volt, or different phases of 277 volt circuits are located in the same outlet box, install partition barriers to limit the voltage to 300 volts to ground, or between adjacent switches. Separate boxes for emergency circuits or lighting switches. On specialty outlets, such as a grounding point, normal and emergency receptacle box, use common box.
  6. Feeder pull boxes may be a common box only in parallel runs; combined feeder circuit pull boxes are not allowed.
  7. Emergency feeder pull box to be a separate box even for parallel runs.

- C. Plaster Rings:
  - 1. Plaster rings shall be installed on all boxes where the boxes are recessed. Plaster rings shall be of a depth to reach the finished surface. Where required, extension rings shall be installed so that the plaster ring is flush with the finished surface.
  - 2. Plaster rings shall be of the number of gangs required to accept the number of devices shown on the Drawings.

### **PART 3 – EXECUTION**

#### **3.01 LOCATIONS**

- A. Installed for all wiring, lighting, power, signal, control, communications, alarms, etc.
- B. GRC:
  - 1. For primary and secondary service and for substation, switchboard, motor controls center, transformer, and panelboard feeders.
  - 2. Buried in or in contact with earth to be PVC coated or half-lapped with 10-20 mil tape by 3M.
  - 3. In poured concrete walls, floor, and roof construction, provided a minimum 2 inches cover is maintained.
  - 4. In all walls up to the first outlet box where fed from rigid conduit in damp locations or locations exposed to the weather.
  - 5. In exposed locations where subject to mechanical injury, including all mechanical rooms, Central Plant facilities, and fire pump rooms.
  - 6. All elbows, except that underground plastic conduit elbows may be used in slab and exterior lighting and power.
  - 7. For hazardous areas.
  - 8. For grounding electrode conductor if exposed overhead, or in or on walls down to equipment.
  - 9. Elsewhere where indicated on the Drawings.
- C. Plastic-coated Rigid Steel:
  - 1. In earth or encased in concrete.
  - 2. In industrial waste treatment areas.
- D. IMC:

1. For secondary service and for switchboard, motor control center, transformer, and panelboard feeders.
  2. Buried in or in contact with earth to be half-lapped with 10-20 mil tape by 3M.
  3. In poured concrete walls, floor, and roof construction, provided a minimum 2 inches cover is maintained.
  4. In all walls up to the first outlet box where fed from rigid conduit in damp locations or locations exposed to the weather.
  5. In exposed locations where subject to mechanical injury, including all mechanical rooms, Central Plant facilities and fire pump rooms.
  6. All elbows for underground plastic conduit.
  7. For hazardous areas.
  8. Elsewhere where indicated on the Drawings.
- E. Electrical Metallic Tubing:
1. In stud partitions and hollow masonry walls.
  2. Connection from junction box to lighting fixtures except in accessible ceilings.
  3. Above suspended or accessible ceilings.
  4. Exposed in dry locations where not subjected to mechanical damage.
  5. Furred ceiling spaces.
  6. For secondary service and distribution feeders in dry locations not subjected to mechanical damage.
- F. Flexible Metal:
1. Connections to cabinet unit heaters, suspended unit heaters, fan, and similar small equipment not exposed to moisture.
  2. Connections from junction box to lighting fixtures in accessible ceilings.
  3. Final connections to all motor-operated equipment, where not exposed to moisture, and in air streams for built-up air handling units.
  4. Connections from junction box to wiring devices in demountable partitions and cabinet work.
  5. To all terminations to equipment subject to vibration, including transformers.
- G. Liquid-tight Flexible Metal:
1. Final connections to all equipment containing water or other liquid service.
  2. Final connections to motor-operated equipment where exposed to moisture.

- H. Rigid Nonmetallic:
1. In earth or encased in concrete duct banks for primary and secondary service and for switchboard, motor control centers transformer, and panel feeders. In earth for communication systems services. Branch circuit wiring for slab and exterior lighting and power may be installed in rigid nonmetallic conduit. Horizontal elbows may be rigid nonmetallic, all vertical elbow stub-ups to above grade shall be GRC or concrete encased non-metallic elbows.
  2. In areas subject to severe corrosive influences.
  3. In areas subject to chemicals for which the materials are specifically approved.
  4. For lightning protection downleads.

### 3.02 SIZES

- A. Minimum size conduit shall be 3/4 inch trade size for branch circuit wiring, signal, and control wiring, except that conduit size shall be increased when branch circuit wiring is increased for voltage drop as indicated in Section 260519, WIRE AND CABLE (600 VOLT). Flexible conduit for connection to lay-in fixtures may be 3/8 inch, maximum of 6'-0" long.
- B. Where required size is not called for on Drawings or in Specifications, provide size required from Chapter 9 of the NEC.
- C. Where specific sizes required by Drawings or Specifications are larger than Code requires, larger size shall be installed.
- D. LB condulets for conduits larger than 2 inches I.D. are not to be used unless of the mogul design, and secured to the building structure within 6 inches below on the long side of the condulet.
- E. Minimum size conduit shall be 1-1/4 inch for communication wiring.

### 3.03 INSTALLATION

- A. General:
1. Conduit system shall be mechanically and electrically continuous from outlet to outlet and to all cabinets, junction, or pull boxes. Conduit shall enter and be secured to all cabinets and boxes in such a manner that all parts will have electrical continuity.
  2. Where panels are installed semiflush, or flush with the walls, empty conduits shall be extended from the panel to an accessible space above. Furnish a minimum of one 3/4 inch conduit for every 3 spare single-pole circuit breakers or spaces or fraction thereof, but never less than 3 conduits. Provide additional conduits where indicated on plan.

3. Raceways Embedded in Floor Slabs:
    - a. Raceways shall not be installed in slab without the approval of the Structural Engineer.
    - b. Raceways shall not interfere with placement of floor slab reinforcement components.
    - c. Install raceways between the upper and the lower layers of reinforcing steel.
    - d. Space raceways not less than 8 inches on centers except where they converge at panels or junction boxes.
    - e. Raceways running parallel to slabs supports, such as beams, columns and structural walls, shall be installed not less than 12 inches from such supporting elements.
    - f. Branch circuit homeruns are not permitted in slab, route branch circuit homeruns above grade exposed in approved areas or above lay-in ceiling spaces.
  4. Raceway above Suspended Ceiling: Install conduit 1'-0" minimum above top of ceiling.
- B. Nonmetallic Conduit:
1. Under building slab, install at a minimum 24 inches below slab or at a minimum 8 inches of cover at grade beams or moment frames. Not under building slab install at a minimum of 36 inches below grade unless otherwise noted.
  2. Provide code sized copper grounding conductor for entire length of raceway and bond at both ends. Ground wire shall be installed inside of conduit.
  3. Conduit joints shall be assembled together with approved couplings to make a watertight joint. Furnish and install expansion fittings on all nonmetallic duct per manufacturer's recommendations.
- C. Rigid Steel Conduits Subject to Corrosion:
1. The following methods of installation will be accepted as meeting the requirements of CEC Section 300-6. Alternate methods will be considered in order to meet local building codes. The installation methods are as follows:
    - a. In Concrete: Galvanized ferrous metal conduit and fittings may be used in concrete above grade and in concrete resting on the ground provided a minimum concrete cover of 2 inches is maintained. Aluminum conduit and fittings are not permitted in concrete.

- b. In Earth: Ferrous metal conduit installed in earth is to be protected from corrosion with a factory-applied coating or approved field coating. Aluminum conduit and fittings are not permitted.
  - c. In Corrosive and Wet Atmosphere: Ferrous metal used is to withstand the exposure involved.
2. Field wrapping requirements are as follows:
- a. Material approval is based on the mil gauge, film material, tensile strength, stretch, adhesion, chemical and physical resistance of film, dielectric strength and electrolytic corrosion. Materials listed in the IAPMO Directory is considered approved material and includes 10, 12, 14, and 20 mil polyvinyl or polyethylene tape.
  - b. Surface Preparation: Oil, grease, rust, scale, moisture, or other foreign material shall be removed by approved paint removers, caustic dips, hand tools, solvents, or other appropriate means. Oil-base solvents shall not be used. Hexane, Toluene, Toluene, Xylol, etc., are acceptable. After cleaning, the pipe is to be kept free of all oil, grease, dirt, and moisture.
  - c. Priming: A coat of primer adhesive is to be applied over cleaned pipe when specified in the manufacturer's directions.
  - d. Application of Coating: Tapes must be spirally wrapped so that the wrapping will have no channels that will enable moisture to contact the steel. Tape is to be half-lapped with enough layers to result in a minimum of 40 mil thickness except for 1 inch and smaller conduits where a 20 mil thickness may be used.
  - e. Overwrap: When pipe exhibits evidence of damage to the factory coating, it may be overwrapped.
  - f. Holiday Detecting: Questionable installations and workmanship, as determined by the Engineer or Building Official, is to be tested by Holiday Test by an approved testing laboratory.
- D. Plastic-coated Rigid Steel Conduits:
- 1. All coupling and joining of pipes to be done with a strap wrench.
  - 2. All bending is to be done per manufacturer's recommendations.
  - 3. All plastic coating that is damaged is to be touched up with touch-up compound provided by the manufacturer, per their recommendations. All screws, bolts, hangars, etc. are also to be touched up.
  - 4. After conductors have been installed a nonhardening putty is to be installed in boxes, condulets, etc., to prevent the free flow of corrosive fumes through the inside of the conduit system.



E. Locations:

1. All conduits shall be concealed, except in crawl spaces, tunnels, mechanical and electrical equipment rooms, and at connections to surface panels and free-standing equipment, unless otherwise shown on the Drawings.
2. Where possible all conduits for wiring within stud or movable partitions shall enter the partition from above.
3. Conduits above lay-in grid-type ceilings shall be installed in such a manner that they do not interfere with the "lift-out" feature of the ceiling system. Conduits shall be independently supported from the building structure.
4. Exposed conduit and conduit above lay-in ceilings shall be routed in lines parallel to building construction.
5. Conduit Runs:
  - a. Conduit runs shall be installed to maintain the following minimum spacing wherever practical.
    - (1) Water and waste piping not less than 3 inches.
    - (2) Steam and condensate lines not less than 12 inches.
    - (3) Radiation and reheat lines not less than 6 inches.
  - b. Seal conduit with RTV silicon or other approved seal where conduit leaves heated area and enters unheated area.
6. Coordinate electric conduits and pipes permitted to be embedded in structural concrete work. Cooperate with respective trades to effect the following:
  - a. All reinforcing steel securely anchored in place before installing conduit.
  - b. No steel displaced without approval from Architect.
  - c. No conduit placed over top reinforcing nor under bottom reinforcing.
  - d. Conduit and their fittings not to displace concrete in columns in excess of 4% of total cross-section area of column without approval of Architect.
  - e. Conduit not to be placed closer than 3 diameters on center.
  - f. Maximum size of embedded conduit not to exceed 1 inch.
7. All conduits where located in outside walls, underground construction, damp locations, or exposed to the weather shall have sealant applied to all joints
8. Projections through roofing shall be made watertight by proper flashing; a sheet metal cap and tightening band or storm collar securely fastened to conduits. Flashing shall be by a qualified contractor and satisfactory to Architect.

9. Provide sleeves wherever conduit 1 inch and larger penetrates a fire rated wall or floor.
  10. When equipment is mounted on a curb, conduits are to be located inside of curbing.
  11. All conduit stubbed up from or through floor slabs for future connections to machines and equipment shall be rigid-type with coupling installed flush with finish floor to permit future conduit removal. For equipment to be installed during this project, bottom of the coupling shall be at the top of the slab. Couplings shall be sealed with a flush, threaded pipe plug.
- F. Elbows, Bends, Expansion Joints:
1. Changes in direction shall be made by bends in the pipe wherever possible, and these shall be made smooth and even without flattening or kinking the pipe or flaking the finish. Bends shall be of as long a radius as possible and in no case smaller than the corresponding trade elbow. Long-radius elbows shall be used where necessary.
  2. Not more than four 90 degree bends will be allowed in one raceway run. Where more bends are necessary, a conduit body or pull box shall be installed. All bends in 1 inch and smaller metal conduits shall be made with a conduit bender and all larger sizes shall have machine bends. All bends shall be made with the proper equipment as recommended by the manufacturer.
  3. Exposed conduit fittings shall be conduit type for all sharp corners, tees, etc. Use mogul type for conduit 2 inches and larger.
  4. Bushing and Locknuts:
    - a. Where conduits enter boxes, panels, cabinets, etc., they shall be rigidly clamped to the box by locknuts on the outside and inside, and grounding bushing on the inside of the box.
    - b. All conduits shall enter the box squarely.
    - c. Insulated Bushings: Furnish and install insulated bushings as required by CEC, Article No. 373-6(c). The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.
    - d. Provide grounding bushings on all feeders, feeder entering and terminating at switchboards, substations, motor control centers, power distribution panels, panelboards, etc. Bond bushings to the ground system by using a continuous No. 6 AWG (minimum) copper bonding jumper.
  5. Provide and install expansion joints at building expansion joints. Expansion joints for feeder conduits shall consist of a sleeve with fittings to provide for telescoping of one of the conduits into sleeve. Movable conduit shall be fitted with insulated bushing joint. Weatherproof shall be made of malleable iron with

corrosion-resistant covering. Provide ground bonding jumper around expansion couplings. Expansion joints for branch circuits shall consist of (72 inches minimum) flexible conduit to allow for expansion and contraction.

6. Open ends of all conduit shall be kept closed with approved conduit seals during the construction of Project.

G. Supports:

1. General:

- a. Conduit, which is not buried or embedded in concrete, shall be supported by straps, clamps, or hangers to provide a rigid installation. See Section 260529, SUPPORTS AND ANCHORS, for types of supports.
- b. Conduit shall not be installed on hangers and/or supports installed by other trades for their use.
- c. Conduit shall not be supported from or attached to ceiling wire and/or suspension systems installed for purposes of accommodating other systems within the building.
- d. Conduit shall not be attached to metal or wood studs above the ceiling used for wall construction.
- e. Conduit shall not be supported from other conduit.
- f. Conduits shall be supported at intervals as indicated in Section 260529, within 3 feet of any bend and every outlet or junction box, panel, etc. This shall apply to vertical runs as well as horizontal runs.
- g. Power-driven pins or studs shall not be used.

2. Single Runs:

- a. Where conduits are run individually, they shall be supported by approved straps, clamps, and hangers.
- b. No perforated straps or wire hangers of any kind shall be used.
- c. Conduits installed exposed in damp locations shall be provided with clamp backs under each conduit clamp to prevent accumulation of moisture around the conduits.
- d. Open bottom, spring tension, snap-in clamps shall not be used.

3. Multiple Runs:

- a. Where a number of conduits are to be run exposed and parallel one with another, they shall be grouped and supported by trapeze hangers.

- b. Each conduit shall be clamped to the trapeze hanger with conduit clamps.
    - 4. Finish:
      - a. All concrete inserts and pipe straps shall be galvanized.
      - b. All steel bolts, nuts, washers, rods, trapeze hangers, and screws shall be galvanized or cadmium-plated.
  - H. Bonding:
    - 1. Both ends of nonmetallic conduit shall be securely bonded to the metallic conduit joining it with adapter couplings designed for this purpose.
    - 2. Provide bond wire in all flexible metal conduits.
  - I. Pull Cord: A polypropylene pull cord shall be installed in all wiring raceways, which do not have conductors pulled by this contractor.
  - J. Color Coding:
    - 1. Provide color bands 1 inch wide for conduits up to 2 inches in diameter and one-half the conduit diameter for larger conduits, applied at panel and pullbox locations, within each room, and 50 feet on center within an area.
    - 2. Color Banding:
      - a. Normal Power 120/208 Volt: Blue.
      - b. Normal Power 277/480 Volt: Yellow.
      - c. Fire Alarm: Red.
      - d. Telephone: Purple.
      - e. Emergency Call/Room Status System: White.
      - f. Public Address System: Brown.
      - g. CCTV: Rust.
      - h. Computer: Green.
      - i. Emergency Power: Orange.
    - 3. Paint exposed medium voltage raceways orange with appropriate warning labels, e.g. "15,000 VOLT CABLE".
  - K. Underground:

1. All underground conduit, except branch circuit and communication conduits, not under buildings slabs or parking lots shall be encased in a minimum of 3 inches concrete all around. Conduit for branch circuit wiring shall be encased under driveways or roads.
  2. All concrete for primary conduit shall contain a red pigment dye to make it readily noticeable minimum 2500psi.
  3. See Section 260543, UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS.
  4. For all underground runs of 2 or more conduits, separators, or spacing blocks made of plastic frames placed on not greater than 4 foot centers. They shall be of the interlocking type both horizontally and vertically. Ducts shall be anchored to prevent movement during placement of concrete.
- L. Identification Tape: Before installing the last 12 inches lift of backfill for all primary feeders and for secondary service feeders to the main switch, install polyethylene identification tape full length of duct bank trench.
- M. Responsibility: It shall be the responsibility of the Contractor to consult with the other trades before installing conduits and boxes. Any conflict between the location of conduit and boxes, piping, ductwork, or structural steel supports shall be adjusted before installation.

In general large pipe mains, waste, drain, and steam lines, large air ducts and all structural steel shall be given priority. Structural modifications to accommodate equipment installation by this trade shall be approved by the Architect prior to starting actual work.

### **3.04 STORAGE**

- A. Plastic and PVC coated conduit shall be stored on a flat surface and protected from the direct rays of the sun. Conduit found to be damaged by sun rays, in the opinion of the Architect, shall be removed from the Project Site.

### **3.05 INSTALLATION - BOXES**

- A. Location:
1. Outlets are only approximately located on the plans and great care must be used in the actual location of outlets by consulting the various detailed Drawings used by other contractors and by securing definite locations from the Architect. Relocation of outlets due to a lack of coordination with other trades will not constitute a reason for additional charges.
  2. Outlets shall be flush with finished wall or ceiling as required, or surface mounted when required. Outlets shall be straight and plumb. Receptacles, switches, etc., shown on wood trim, cases, or other fixtures shall have their boxes installed symmetrically on such trim or fixture.

3. Switch boxes shall be located on the lock side of the door regardless of the notation on the Drawings.
  4. Pull boxes shall be installed where required to pull cable or wire, but only in finished areas by approval of the Architect. Pull boxes shall be installed on all conduit runs for feeders at intervals of not to exceed 150'-0" or as shown on the Drawings.
  5. Pull boxes shall be installed in accessible locations.
- B. Fasteners and Supports:
1. Cabinets and boxes shall be secured by means of expansion anchors on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction.
  2. Wall- and ceiling-mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Do not fasten outlet boxes directly to wall or ceiling where they are of drywall or plaster construction; provide bar supports.
  3. Boxes shall be rigidly attached to the structure, independent of any conduit support.
  4. Boxes shall not be fastened to ceiling grid or tile unless specifically designed for this purpose and then only by the approval of the Architect. Ceiling grid box supports shall be of the type designed and manufactured for this purpose. Makeshift supports shall not be used.

### **3.06 IDENTIFICATION**

- A. Box Covers:
1. Label on outside to identify panel and circuit numbers. Use indelible markers, nonerasing type for boxes not in finished areas.
  2. Fire alarm pull and junction boxes shall be painted red.
  3. Label feeder pull boxes as to circuit with 2 inches high stencil letters; white letters for normal, red letters for emergency.

### **3.07 CODING**

- A. Provide electrical box color coding to match conduit system.

**END OF SECTION**

## **SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.02 SUMMARY**

- B. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

#### **1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For arc-flash hazard study.

## **PART 2 – PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Comply with ASME A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Comply with NFPA 70E and Section 260574 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.
- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg. F, ambient; 180 deg. F, material surfaces.

### **2.02 COLOR AND LEGEND REQUIREMENTS**

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage.
- B. Color-Coding for Phase and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
  - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
  - 2. Colors for 208/120-V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.
    - c. Phase C: Blue.
  - 3. Colors for 480/277-V Circuits:
    - a. Phase A: Brown.
    - b. Phase B: Orange.
    - c. Phase C: Yellow.



4. Color for Neutral: White.
  5. Color for Equipment Grounds: Green.
  6. Colors for Isolated Grounds: Green with white stripe.
- C. Raceways and Cables Carrying Circuits at More Than 600 V:
1. Black letters on an orange field.
  2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- D. Warning Label Colors:
1. Identify system voltage with black letters on an orange background.
- E. Warning labels and signs shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
  2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR MINIMUM 36 INCHES."

### **2.03 LABELS**

- A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
- B. Snap-around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.
- C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil- thick, polyester flexible label with acrylic pressure-sensitive adhesive.
1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
  2. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.
  3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.
- D. Self-Adhesive Labels: Polyester, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:
  - a. 1-1/2 by 6 inches for raceway and conductors.
  - b. 3-1/2 by 5 inches for equipment.
  - c. As required by authorities having jurisdiction.

#### **2.04 BANDS AND TUBES**

- A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters and that stay in place by gripping action.
- B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at a maximum of 200 deg. F. Comply with UL 224.

#### **2.05 TAPES AND STENCILS**

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
- C. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and is 12 inches wide. Stop stripes at legends.
- D. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
- E. Underground-Line Warning Tape:
  1. Tape:
    - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
    - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
  2. Color and Printing:
    - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.

- b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
- c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
- 3. Tag: Type I:
  - a. Pigmented polyolefin, bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches.
  - c. Thickness: 4 mils.
  - d. Weight: 18.5 lb/1000 sq. ft.
  - e. Tensile according to ASTM D 882: 30 lbf. and 2500 psi.
- F. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

## **2.06 TAGS**

- A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
- C. Write-on Tags:
  - 1. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment.
  - 2. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
  - 3. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

## **2.07 SIGNS**

- A. Baked-Enamel Signs:
  - 1. Preprinted aluminum signs, high-intensity reflective, punched or drilled for fasteners, with colors, legend, and size required for application.
  - 2. 1/4-inch grommets in corners for mounting.
  - 3. Nominal Size: 7 by 10 inches.

- B. Metal-Backed Butyrate Signs:
  - 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
  - 2. 1/4-inch grommets in corners for mounting.
  - 3. Nominal Size: 10 by 14 inches.
- C. Laminated Acrylic or Melamine Plastic Signs:
  - 1. Engraved legend.
  - 2. Thickness:
    - a. For signs up to 20 sq. in., minimum 1/16 inch thick.
    - b. For signs larger than 20 sq. in., 1/8 inch thick.
    - c. Engraved legend with black letters on white face.
    - d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
    - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

**2.08 CABLE TIES**

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 Deg. F according to ASTM D 638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg. F.
  - 4. Color: Black, except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg. F.
  - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg. F according to ASTM D 638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg. F.
5. Color: Black.

## **2.09 MISCELLANEOUS IDENTIFICATION PRODUCTS**

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### **3.02 INSTALLATION**

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.
- H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
1. Secure tight to surface of conductor, cable, or raceway.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer, load shedding.
- K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
- L. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:
1. "EMERGENCY POWER."
  2. "POWER."
  3. "UPS."
- M. Vinyl Wraparound Labels:
1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
  2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- N. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.
- O. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.
- P. Self-Adhesive Labels:
1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
  2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.

- Q. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.
- R. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.
- S. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.
- T. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
  - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- U. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.
- V. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.
- W. Underground Line Warning Tape:
  - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
  - 2. Limit use of underground-line warning tape to direct-buried cables.
  - 3. Install underground-line warning tape for direct-buried cables and cables in raceways.
- X. Metal Tags:
  - 1. Place in a location with high visibility and accessibility.
  - 2. Secure using UV-stabilized cable ties.
- Y. Nonmetallic Preprinted Tags:
  - 1. Place in a location with high visibility and accessibility.
  - 2. Secure using UV-stabilized cable ties.
- Z. Write-on Tags:
  - 1. Place in a location with high visibility and accessibility.
  - 2. Secure using general-purpose cable ties.
- AA. Baked-Enamel Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
  2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on minimum 1-1/2-inch- high sign; where two lines of text are required, use signs minimum 2 inches high.
- BB. Metal-Backed Butyrate Signs:
1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
  2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch- high sign; where two lines of text are required, use labels 2 inches high.
- CC. Laminated Acrylic or Melamine Plastic Signs:
1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
  2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch- high sign; where two lines of text are required, use labels 2 inches high.
- DD. Cable Ties: General purpose, for attaching tags, except as listed below:
1. Outdoors: UV-stabilized nylon.
  2. In Spaces Handling Environmental Air: Plenum rated.

### **3.03 IDENTIFICATION SCHEDULE**

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.
  1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- D. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage. System legends shall be as follows:



1. "EMERGENCY POWER."
  2. "POWER."
  3. "UPS."
- E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels, self-adhesive wraparound labels, snap-around labels, snap-around color-coding bands, self-adhesive vinyl tape to identify the phase.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use write-on tags or self-adhesive labels with the conductor or cable designation, origin, and destination.
- G. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat-shrink preprinted tubes or self-adhesive labels with the conductor designation.
- H. Conductors to Be Extended in the Future: Attach write-on tags or marker tape to conductors and list source.
- I. Auxiliary Electrical Systems Conductor Identification: Marker tape or Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
- J. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- K. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- L. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.
- M. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs or Metal-backed, butyrate warning signs.
1. Apply to exterior of door, cover, or other access.
  2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:

- a. Power-transfer switches.
- b. Controls with external control power connections.
- N. Arc Flash Warning Labeling: Self-adhesive labels.
- O. Operating Instruction Signs: Laminated acrylic or melamine plastic signs.
- P. Emergency Operating Instruction Signs: Laminated acrylic or melamine plastic signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer and load shedding.
- Q. Equipment Identification Labels:
  - 1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
  - 2. Outdoor Equipment: Laminated acrylic or melamine sign.
  - 3. Equipment to Be Labeled:
    - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a laminated acrylic or melamine label.
    - b. Enclosures and electrical cabinets.
    - c. Access doors and panels for concealed electrical items.
    - d. Switchgear.
    - e. Switchboards.
    - f. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
    - g. Substations.
    - h. Emergency system boxes and enclosures.
    - i. Motor-control centers.
    - j. Enclosed switches.
    - k. Enclosed circuit breakers.
    - l. Enclosed controllers.
    - m. Variable-speed controllers.
    - n. Push-button stations.
    - o. Power-transfer equipment.
    - p. Contactors.

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- q. Remote-controlled switches, dimmer modules, and control devices.
- r. Battery-inverter units.
- s. Battery racks.
- t. Power-generating units.
- u. Monitoring and control equipment.
- v. UPS equipment.

**END OF SECTION**

**SECTION 26 27 26 – WIRING DEVICES**

**PART 1 – GENERAL**

**1.01 GENERAL REQUIREMENTS**

- A. Switches.
- B. Dimmers.
- C. Receptacles.
- D. Cover Plates.
- E. Interchangeable Units.
- F. Occupancy Sensors.

**1.02 SUBMITTALS**

- A. Manufacturer's literature describing product.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Hubbell
- B. Leviton
- C. Pass & Seymour
- D. General Electric
- E. Bryant
- F. Arrow Hart

**2.02 SWITCHES**

- A. Toggle: Specification grade, AC quiet type, 20 amp, 120/277 volt, No. 1221 Series.
- B. Key Operated: Specification grade, AC quiet type, single pole, 20 amp, 120/277 volt, No. 1221-L Series.
- C. Momentary Contact: Specification grade, 3 position, single pole, double throw, 20 amp, 120/277 volt, No. 1157 Series.
- D. Lighted Handle Pilot Type: Specification grade, AC quiet type, single pole, 20 amp, 120 volt, No. 1221-PLC.

- E. Lighted Handle Locator Type: Specification grade, AC quiet type, single pole, 20 amp, 120 volt, No. 1221-ILC.

**2.03 DIMMERS**

- A. See Drawings for specific types.

**2.04 RECEPTACLES**

- A. Uncontrolled Receptacle: Specification grade: Duplex, 2 pole, 3 wire, grounding type, 20 amp, 125 volt, No. 5362 Series.
- B. Completely Controlled Receptacle: Specification grade: Duplex, 2 pole, 3 wire, grounding type, 20 amp, 125 volt, with controlled receptacle marking(s), No. 26362 Series.
- C. Split-Circuit Tab Controlled Receptacle: Specification grade: Duplex, 2 pole, 3 wire, grounding type, 20 amp, 125 volt, with controlled receptacle marking(s), No. 26362 Series CH version. CH version has the split-circuit tab broken at the factory, allowing half of the receptacle to be controlled.
- D. Isolated Ground: Duplex, 2-pole, 3-wire. 20A, 125 volt, No. IG-5362 Series.
- E. Ground Fault Circuit Interrupter: Duplex, 2 pole, 3 wire duplex, grounding type, 20 amp, 125 volt No. GF-8300, No. GF-5362 Series.

**2.05 PLATES**

- A. Provide high abuse nylon wallplates.
- B. Weatherproof: No. 5205W0, No. 5206W0.
- C. Exposed Boxes: Raised covers or stamped sheet metal.
- D. Mounting Screws: Stainless steel, painted head to match plate finish.
- E. Engraved with 1/4 inch high legend or thermal labels as indicated in 16010.
- F. Plates shall be 1-piece standard size; no oversized or sectional plates.

**2.06 COLOR**

- A. Devices and plates for normal power services shall be white.
- B. Devices and plates for emergency power services shall be red.
- C. Devices and plates for isolated ground shall be orange.

**2.07 INTERCHANGEABLE DEVICES**

- A. These devices shall not be used.

### **PART 3 – EXECUTION**

#### **3.01 INSTALLATION**

- A. Locate all switches, receptacles, etc., as indicated on Architectural Drawings (elevations). Devices located in areas other than janitor's closets, supply rooms, etc., and not indicated on Architectural Drawings shall be located as directed.
- B. Adjust mounting heights of devices in exposed or painted masonry walls so devices are at nearest mortar joint; verify locations with Architect.
- C. In walls with tile, adjust device height so device is either all in tile or all in wall above tile.
- D. Where switches are located adjacent to doors, they shall be installed within 6 inches of door frame on lock side of door.
- E. Verify door switch, wall construction and finish, cabinets, counters, etc., and coordinate device installation.
- F. Locations:
  - 1. Device locations are shown diagrammatically and final locations shall be coordinated with Architect details, elevations, etc. Locations to be symmetrical and with an area, at uniform heights, unless otherwise indicated or directed.
  - 2. Install devices vertically, unless otherwise indicated.
  - 3. Install grounding terminals at top.

#### **3.02 COMMISSIONING**

- A. Refer to and 260100, Electrical General Requirements for system commissioning requirements.

**END OF SECTION**

**SECTION 26 50 00 – LUMINAIRES AND ACCESSORIES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide luminaires and accessories in accordance with the Contract Documents.

**1.02 QUALITY ASSURANCE**

- A. Drivers shall be of the same manufacturer for each luminaire type.
- B. Occupancy sensors shall be certified for operation with specific ballasts, drivers and control system utilized in controlled lighting fixtures.
- C. Equipment shall be certified for use in the State of the project and shall meet the State Energy Code and local energy ordinances.
- D. All drivers and ballasts are to be compatible with the lighting control system. See section 26 09 23 for Building Lighting Controls System.

**1.03 STANDARDS**

- A. Cords: UL 62.
- B. Exit Signs and Emergency Luminaires: NFPA 70 and UL 101 and 924.
- C. Hazardous Locations: UL 506, 844, 1203, and 1225.
- D. Luminaires: UL 57, 676, 1570, 1571, and 1572.
- E. Photometric data: Independent testing laboratory certified.
- F. State Energy Regulations.
- G. Solid State Lighting (LED):
  - 1. American National Standards Institute (ANSI)
  - 2. ANSI C62.41.1-2002 – IEEE Guide on the Surge Environment in Low-Voltage (1000V and less) AC Power Circuits
  - 3. ANSI C62.41.2-2002 – IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000W and less) AC Power Circuits
  - 4. ANSI C82.SSL1 – SSL Drivers (in ANSI development)
  - 5. ANSI C136.31-2001 – American National Standard for Roadway Lighting Equipment – Luminaire Vibration
  - 6. American Society for Testing and Materials International (ASTM)

7. ASTM B117-97 – Standard Practice for Operating Salt Spray (Fog) Apparatus
8. ASTM G53 – Standard Practice for Operating Light and Water Exposure Apparatus (UV – Condensation Type) for Exposure of Nonmetallic Materials
9. Illuminating Engineering Society of North America (IESNA)
10. DG-13-98, Guide for the Selection of Photocontrols for Outdoor Lighting Applications
11. G-1-03, Guidelines for Security Lighting
12. LM-79-08, IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products
13. LM-80-08, IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources
14. RP-33-99, Recommended Practice for Lighting for Exterior Environments
15. TM-15-07 (Revised), Luminaire Classification System for Outdoor Luminaires
16. International Electrotechnical Commission (IEC)

#### **1.04 SUBMITTALS**

- A. Manufacturer's product data sheets for each luminaire indicating luminaire type, driver quantity and type, board/diode quantity and type, photometric data, materials, finishes, accessories, voltage, input watts, CFM data, and photographic image of luminaire.
- B. Manufacturer's data sheets for each driver including as applicable the driver type, power factor, input voltage, input watts.
- C. Scaled and dimensioned detail plan and elevation drawings of custom and continuous row type luminaires.
- D. Seismic restraint calculations stamped by a currently registered professional engineer.
- E. Coordination drawings shall be prepared with input from all other disciplines.
- F. All product deviations from the contract documents shall be submitted as a substitution. Failure to comply shall result in rejection and return of the submittal.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Lighting Luminaires: Refer to luminaire schedule on the Drawings.

#### **2.02 LIGHT EMITTING DIODE (LED) LUMINAIRES**

- A. Lumens per input watt shall not be less than 50.



- B. R9 values shall not be less than 10 for interior luminaires.
- C. CRI shall not be less than 80 for interior luminaires.
- D. L70 shall not be less than 50,000 hours.
- E. Color temp. of 3500k (indoor) and 4000k (outdoor) within a 4-step MacAdam ellipse.
- F. Dimming performance 10-100% without flicker or noise.
- G. A minimum of five (5) year manufacturer limited warranty shall be required for LED boards and drivers. Or the standard manufacturer's warranty provided this is greater than the five year minimum required.
- H. Power supplies including those integral to drivers shall have a minimum efficiency of 85%.
- I. Drivers shall have a Power Factor of >0.90.
- J. Drivers shall have a Total harmonic Distortion of <20%.

### **2.03 MATERIALS AND FABRICATION**

- A. Luminaires shall be completely factory assembled and wired, and equipped with necessary lampholders, ballasts, wiring, shielding, reflectors, channels, lenses, and other parts necessary to complete the luminaire installation.
- B. Luminaire hardware shall be concealed. Weld exposed metal at joints, fill with weld material, grind smooth, and make free from light leaks. Gasket luminaires with overlapping trim. Weld ballast support studs, socket saddle studs, and reflector support studs to luminaire body; self threading screws are not acceptable. Ventilate ballast compartments and firmly secure ballast to conducting metal surface. Luminaires shall be designed for bottom relamping, unless otherwise noted.
- C. Construct luminaires with a minimum number of joints. Unexposed joints by shall be welded, screwed or bolted; soldered joints are not acceptable. Do not use self tapping methods or rivets for fastening removable parts used to gain access to electrical components requiring service or replacement, or for fastening electrical components or their supports.
- D. Cast or extruded parts of luminaires shall be close grained and free from imperfections or discolorations, rigid, true to pattern, of ample weight and thickness, and properly fitted, filed, ground, and buffed to provide finished surfaces and joints free of imperfections.
- E. Housings for luminaires shall be designed to make electrical components, including the diode boards, easily accessible and replaceable, without removing the luminaire body from its mounting.

### **2.04 FINISHES**

- A. Luminaire finishes shall provide a durable, wear resistant surface. Surfaces shall be chemically cleaned and treated with corrosion inhibiting (phosphating) material to assure positive paint adhesion. Exposed metal surfaces (brass, bronze, aluminum, etc.) and finished castings (except chromium plated or stainless steel parts) shall have an even coat of high grade methacrylate lacquer or transparent epoxy. Anodize exposed aluminum surfaces in a 20 minute bath for corrosion resistance. Sheet steel luminaire housings, and iron and steel parts which have not received phosphating treatment, or which are to be utilized in exterior applications, shall be zinc or cadmium plated, or hot dip zinc galvanized after completion of all forming, welding, and drilling operations.
- B. Screws, bolts, nuts, and other fastening or latching hardware shall be cadmium plated.
- C. Provide luminaires with a high temperature baked enamel coating of selected color and finish, unless otherwise noted. White baked enamel finished surfaces shall have a minimum reflectance of 86%, unless otherwise noted.

## **2.05 REFLECTORS**

- A. Aluminum Reflectors:
  - 1. Reflectors and reflecting cones or baffles shall be as specified on the lighting fixture schedule or shall be fabricated from #12 aluminum reflector sheet, minimum 0.057 inches thick (15 gauge). Material shall be free of tooling marks, spinning lines, and marks or indentation caused by riveting or other assembly techniques. No rivets, springs, or other hardware shall be visible after installation.
  - 2. Reflectors and baffles shall be polished, buffed, and anodized (Alzak) and as noted on the lighting fixture schedule, with finish color as selected by the Architect.
- B. Painted Reflectors:
  - 1. Painted reflectors shall be as specified on the lighting fixture schedule or shall be formed before application of primer and paint. Reflectors and reflector bodies for luminaires with baked white enamel finish shall meet the following requirements and tests:
    - a. After 100 hours of exposure to fade-o-meter, reflectance shall be not less than 86%, and finish shall show no visible color change.
    - b. After 100 hours of exposure to 100% humidity at 100°F, (cook box test) finish shall show no blistering or other degraded effects.
    - c. After 150 hours of exposure to salt spray (20% sodium chloride) shall cause no breakdown of film.

## **2.06 LENSES, FACEPLATES AND TRIMS**

- A. Plastic lenses shall be of virgin methyl methacrylate, unless otherwise indicated. Polystyrene lenses are not acceptable.

- B. Lenses, louvers, and other light diffusing components shall be contained in frames. Lenses shall be removable but positively held within the frames so that hinging or other motion of the frame will not cause the diffusing components to drop out.
- C. Provide ceiling trims for rectangular recessed luminaires with mitered corners, continuously welded and smoothed before shop finishing. Lapping of trim metal is not acceptable.

## **2.07 LUMINAIRE WIRING**

- A. Provide wiring between drivers and diode board of the same or heavier gauge than the leads furnished with the drivers, and having same or higher insulating and heat resisting characteristics. Internal wiring of luminaires shall contain a minimum number of splices. Splices shall be made with suitable mechanical insulated steel spring type connectors.
- B. Wiring channels and wireways shall be free from projections and rough or sharp edges. Provide bushings at points or edges over which conductors pass.

## **2.08 ACCESSORIES**

- A. Where utilized as raceways, luminaires shall be suitable for use as raceways. Provide feed through splice boxes where necessary.
- B. Provide installation and supporting hardware including stems, plates, plaster frames, hangers, and similar items, for support of luminaires for the ceiling construction in which they shall be installed. Provide plaster frames made of non ferrous metal, or of steel that has been suitably rustproofed after fabrication.
- C. Interior luminaires sound ratings lower than A, shall be provided with acoustical mounting pads between luminaire housing and driver to minimize vibration and noise level.
- D. Provide fastening devices of a positive locking type, which do not require special tools to apply or remove them. Do not use tie wires in place of fastening devices.
- E. Attach reflectors to housing by means of safety chains to prevent reflectors from falling. No part of the chain shall be visible after installation.
- F. Provide a ceiling canopy for each stem or connection point. Canopy finish shall match stem finish.
- G. Luminaires installed in air plenums shall be fully enclosed and gasketed and rated for plenum use.
- H. Provide additional feed points in luminaires connected to the emergency power system to accommodate the additional wiring for power and controls.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. Luminaire locations as indicated on the Drawings are general and approximate. Verify exact location and mounting height of luminaires with the Architect prior to installation. Verify adequacy of clearance with other equipment such as but not limited to ducts, pipes, conduit, cable tray or structural elements. Bring all conflicts to the Architect's attention before proceeding with work.
- B. Verify ceiling construction and furnish appropriate luminaire mounting supports, hardware, trim, and accessories for each luminaire.
- C. Install luminaires in mechanical equipment rooms after ductwork and piping installation. Locate and mount luminaires as indicated on the Drawings unless mechanical equipment prohibits or makes it impractical to do so. In such cases, chain or wall mount luminaires so that equipment requiring service is illuminated.
- D. Luminaires and final installation shall be installed free of light leaks, warps, dents, or other irregularities. Light leaks are not acceptable.
- E. Install reflector cones, aperture plates, lenses, diffusers, louvers, and decorative elements of luminaires after completion of wet work, plastering, painting, and general clean up in the area of the luminaires. Provide final focusing and adjusting of lighting equipment. Focusing and adjusting shall be performed under the Architect's supervision after normal working hours.
- F. Visible hanging devices shall be finished to match the luminaire finish, unless otherwise noted. Suspended fixtures shall hang level and aligned when installed in rows.
- G. Provide fire rated enclosures around recessed luminaires that are installed in fire rated ceilings.
- H. Provide attachment devices, brackets, plaster rings, saddle hanger and tie bars made of formed, rolled, or cast metal shapes with the requisite rigidity and strength to maintain continuous alignment and support of installed luminaires.
- I. Luminaires mounted in suspended ceilings shall be attached to the main runners of the ceiling system with appropriate mounting hardware. Provide independent 458 slack cables from at least two corners of luminaires to structure above.
- J. Provide at least two supports for single luminaires. Where luminaires are continuously mounted in rows, provide supports at maximum intervals of 8 feet, or closer if necessary to prevent visible deflection.
- K. Equipment requiring access for service and maintenance shall be installed so that components requiring access are readily accessible and are provided with any and all access panels necessary to provide access.
- L. Immediately prior to occupancy clean free of all markings and smudges; reflectors, reflector cones, aperture plates, lenses, trim rings, faceplates, louvers, lamps and decorative elements.

- M. Replace burnt out luminaires or replaceable boards where more than 1% of the diodes have failed or components are noisy or defective or are otherwise are non-functioning parts of the complete lighting system.
- N. Luminaires with connected to an emergency source of power shall be connected to unswitched or switched circuits or both as shown on the plans and shall be equipped with any UL 924 listed power transfer devices and labor necessary to provide the operation shown.

**END OF SECTION**

**SECTION 27 05 00 – COMMUNICATIONS COMMON WORK RESULTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes, but is not necessarily limited to:
  - 1. Common standards and procedures for the Communications Work.
  - 2. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of the Communications Systems. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction.
- B. Provisions of this Section apply to Communications Work, including the following Sections:
  - 1. Section 27 05 29 – Hangers and Supports for Communications Systems
  - 2. Section 27 05 33 – Conduits and Backboxes for Communications Systems
  - 3. Section 27 05 53 – Identification for Communications Systems
  - 4. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
  - 5. Section 27 11 19 – Communications Termination Blocks and Patch Panels
  - 6. Section 27 11 23 – Communications Cable Management
  - 7. Section 27 15 00 – Communications Horizontal Cabling

**1.02 REFERENCES**

- A. Usage: In accordance with Division 1.
- B. American National Standards Institute (ANSI)
  - 1. ANSI/TIA/EIA-568-B.1-2001, Commercial Building Telecommunications Cabling Standard – Part1: General Requirements
  - 2. ANSI/TIA/EIA-568-B.2-2001, Commercial Building Telecommunications Cabling Standard – Part2: Balanced Twisted Pair Cabling Components
  - 3. ANSI/TIA/EIA-568-B.3-2000, Optical Fiber Cabling Components Standard
  - 4. ANSI/TIA/EIA-606-A-2002, Administration Standard for Commercial Telecommunications infrastructure

**1.03 DEFINITIONS**

- A. General Abbreviations used in these specifications. Refer additionally to the abbreviations list appearing on the Drawings.

1. ADA Americans With Disabilities Act.
2. AFC Above Finished Ceiling.
3. AFF Above the Finished Floor.
4. BLDG Building
5. CAT Category
6. CL Centerline
7. DIV Division
8. (E) Existing
9. FBO Furnished by Owner
10. HR Home Run
11. ID Inside Diameter
12. LAN Local Area Network
13. MAX Maximum
14. NIC Not in Contract.
15. OD Outside Diameter
16. OFE Owner Furnished Equipment.
17. PSRH Project Standard Receptacle Height.
18. PSSH Project Standard Switch Height.
19. TYP Typical
20. UON Unless Otherwise Noted.

**B. Reference to Named Products**

1. Selected Item: Item so noted was selected based on comparative testing of similar products. Procedure for determination of equivalence is noted in the specification for the item(s).
2. System Design Basis: Item so noted interacts with other system items to produce total system function. Substitution of this item may require coordinated substitution of other system items.
3. Design Basis: Item so noted was used as basis for system drawings to establish features, size, etc. Use of specified equivalents may require adjustment of physical layout or wiring, but does not affect system function. No preference is implied.

**1.04 SUBMITTALS**

A. Comply with Division 1 and the following.

1. Submit all materials for review arranged in same order as Specifications, individually referenced to Specification Section, Paragraph and Contract Drawing number. Conform in every detail as applies to each referencing Section.
2. Submit 8 ½"x 11" items bound in volumes and drawings in edge bound sets. Submit all drawings on sheets of the same size.
3. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.
4. Progress Schedule: Comply with Division 1.

B. Manufacturer's Product Data:

1. Manufacturer's Product Data Sheets. Collate in sequence of List of Materials:
2. Data sheet for each item in each Communications Section, including all accessories, clearly marked for proposed product.
3. Material Safety Data Sheet, where applies.
4. List of Materials Schedule. For each item, include:
  - a. Referencing Specification Section
  - b. Referencing Paragraph
  - c. Referencing Drawing, if specified only on plans
  - d. Manufacturer.
  - e. Model number.
  - f. Listing, including name of Nationally Recognized Testing Laboratory.
  - g. Precede each submittal book with a summary schedule, with columns for each item above and rows for each item submitted.

Specification Section	Paragraph	Contract Drawing Reference	Manufacturer	Model No.	UL/ CLA Listed
27 05 00	2.03C		XYZ	123	Y
27 15 00	2.07A1		AAA	34-56	Y
		T4.2	ZZY	456	Y

C. Field (Installation) Drawings: Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of



equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. Collate in sequence:

1. Drawing index/symbol sheet.
2. Floor plans.
  - a. Provide registered communications distribution designer (RCDD) approved, drawings in accordance with ANSI/TIA/EIA-606-A. The identifier for each termination and cable shall appear on the drawings. Drawings shall depict final telecommunications installed wiring system infrastructure in accordance with ANSI/TIA/EIA-606-A.
  - b. The following drawings shall be provided as a minimum:
    - (1) Layout of complete building per floor -Building Area/Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways. Layout of complete building per floor. The drawing indicates location of building areas, serving zones, vertical backbone diagrams, telecommunications rooms, access points, pathways, grounding system, and other systems that need to be viewed from the complete building perspective.
    - (2) Serving Zones/Building Area Drawings -Drop Locations and Cable Identification (ID'S). Shows a building area or serving zone. These drawings show drop locations, telecommunications rooms, access points and detail call outs for common equipment rooms and other congested areas. At scale of Contract Documents. Show:
      - (a) Device locations and type
      - (b) Rough-in.
      - (c) Mounting height.
      - (d) Conduit size.
      - (e) Wire type.
      - (f) Wire fill.
3. Telecommunications Space Drawings
  - a. Provide drawings in accordance with EIA TIA/EIA-606-A that include telecommunications rooms plan views, pathway layout (cable tray, racks, ladder-racks, etc.), mechanical/electrical layout, and cabinet, rack, backboard and wall elevations.
  - b. Drawings shall show layout of applicable equipment including incoming cable stub or connector blocks, building protector assembly, outgoing cable connector blocks, patch panels and equipment spaces and cabinet/racks.

- c. Drawings shall include a complete list of equipment and material, equipment rack details, proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearance for maintenance and operation.
  - d. At scale of Contract Documents, the Contractor shall submit scaled drawing elevations (showing dimensions, mounting locations and associated frames & equipment) for all required assemblies, including but not limited to:
    - (1) Telephone termination boards
    - (2) Wall mounted splice cases
    - (3) Wall mounted copper cable terminations.
    - (4) Wall mounted fiber optic cable terminations.
    - (5) Clearances
    - (6) Backboard Wire and Cable Management
    - (7) Copper cable patch panels.
    - (8) Fiber optic cable patch panels.
    - (9) Rack layouts.
  - e. Drawings may also be an enlargement of a congested area of T1 or T2 drawings.
4. System Conduit and Riser Diagrams, Show:
- a. Single line diagram of structured wiring
  - b. Grounding and bonding scheme
  - c. Terminal cabinets.
  - d. Coordination with floor plans.
  - e. Wire runs not shown on floor plans.
  - f. Wire type.
  - g. Wire fill.
5. Typical Detail Drawings
- a. Faceplate Labeling,
  - b. Fire stopping,
  - c. Details of flexible raceway connections to be made to vibrating equipment
  - d. Details of J-Box and sealant application for the typical conditions listed in Section 27 05 48.

- e. California Access Compliance Manual and Americans with Disabilities Act (ADA) compliance.
  - f. Detailed drawings of symbols and typical details, such as faceplate labeling, faceplate types, faceplate population installation procedures, detail racking, and raceways.
6. Schedules of Application
- a. An itemized list of all items of equipment to be fitted with flexible electrical connections.
  - b. Catalog cuts of the products to be applied as J-Box mastic and Acoustical Sealant, and a schedule of rooms to receive application of mastic and sealant at J-Boxes
- D. Shop Drawings: Submit the following and secure approvals prior to fabrication:
- 1. Specific details of restraints including anchor bolts for mounting and maximum loading at each location, showing compliance and coordination with Code and the project Architectural, Structural and Mechanical Documents.
  - 2. Mounting details:
    - a. Stamped and signed by an Engineer licensed in the Project jurisdiction for work of this type for loads over 20 lbs.
    - b. Show loads, type and strength of connections, sizes, dimensions, materials, etc.
    - c. Show calculations on drawings or in bound volume for review by Authorities having jurisdiction.
    - d. Provide details for:
      - (1) Equipment Rack anchorage.
      - (2) Wall Mounted Racks and Enclosures.
      - (3) Cable Runway and Cable Tray
      - (4) Ceiling and Wall Supported Projectors
      - (5) Motorized and Manual Projection Screens
      - (6) Wall and ceiling attachments or components weighing 20 pounds or more.
      - (7) Installation details as required:
      - (8) Terminal cabinets: Terminations.
      - (9) Voice cable plant: Cut sheets for use by Owner's PBX Contractor

3. Samples: Samples for review by the Owner's Representative of all finishes/materials which will be visible to the public, including but not limited to:
  - a. Receptacles. The Contractor shall submit a mock up sample of each type of communication outlet including conduit, wall box, faceplate, communication cables, jacks and jack identifying labels.
  - b. The Contractor shall submit a sample of each type of label to be used for labeling cables, patch panels, termination frames, and faceplates for the telephone and data systems.
  - c. Surface Raceway, for each type:
    - (1) Raceway base and cover, at least 5 foot section.
    - (2) Boxes, at least two of each type to be used.
    - (3) For other items, provide at least 2"x 2" sample.
4. Manufacturer's Field Reports
  - a. Factory reel tests
5. Test plan
6. Project Site Test Reports:
  - a. Schedule: Submit test reports in timely manner relative to Project schedule such that the Owner's Representative may conduct verification of submitted test data without delay of scheduled progress.
  - b. Project Site test report: Submit following system completion and prior to and as condition precedent to Acceptance Review and Testing of the Work of this Section
  - c. Content: Include at least:
    - (1) Time and date of test.
    - (2) Personnel conducting test.
    - (3) Test equipment, including serial and date of calibration.
    - (4) Test object.
    - (5) Procedure used.
    - (6) Results of test
    - (7) Numerical or graphical presentation.
    - (8) Electronic file in format and media directed by the Owner's Representative.

## 1.05 QUALITY ASSURANCE

A. Procedures: In accordance with Division 1.

B. Qualifications

1. Telecommunications Qualifications

a. Work under this section shall be performed by and the equipment shall be provided by the telecommunications contractor and key personnel. Qualifications shall be provided for:

- (1) The telecommunications system contractor
- (2) The telecommunications system installer
- (3) The supervisor (if different from the installer).

b. A minimum of 30 days prior to installation, submit documentation of the experience of the telecommunications contractor and of the key personnel.

2. Telecommunications Contractor

a. The telecommunications contractor shall be a firm which is regularly and professionally engaged in the business of the applications, installation, and testing of the specified telecommunications systems and equipment.

- (1) The telecommunications contractor shall demonstrate experience in providing successful telecommunications systems within the past 3 years.
- (2) Submit documentation for a minimum of three and a maximum of five successful telecommunication system installations for the telecommunications contractor.

b. Key Personnel

- (1) Provide key personnel who are regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. There may be one key person or more key persons proposed for this project depending upon how many of the key roles each has successfully provided. Each of the key personnel shall demonstrate experience in providing successful telecommunications systems within the past 3 years.
- (2) Supervisors and installers assigned to the installation of this system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel.
- (3) In lieu of BICSI certification, supervisors and installers assigned to the installation of this system or any of its components shall have a minimum of 3 years experience in the installation of the specified

copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. Submit documentation for a minimum of three and a maximum of five successful telecommunication system installations for each of the key personnel. Documentation for each key person shall include at least two successful system installations provided that are equivalent in system size and in construction complexity to the telecommunications system proposed for this project. Include specific experience in installing and testing telecommunications systems and provide the names and locations of at least two project installations successfully completed using optical fiber and copper telecommunications cabling systems. All of the existing telecommunications system installations offered by the key persons as successful experience shall have been in successful full-time service for at least 18 months prior to the issuance date for this project. Provide the name and role of the key person, the title, location, and completed installation date of the referenced project, the referenced project owner point of contact information including name, organization, title, and telephone number, and generally, the referenced project description including system size and construction complexity.

- (4) Indicate that all key persons are currently employed by the telecommunications contractor, or have a commitment to the telecommunications contractor to work on this project. All key persons shall be employed by the telecommunications contractor at the date of issuance of this project, or if not, have a commitment to the telecommunications contractor to work on this project by the date that the bid was due to the Owner's Representative.
  - (a) Note that only the key personnel approved by the Owner's Representative in the successful proposal shall perform work on this project's telecommunications system. Key personnel shall function in the same roles in this contract, as they functioned in the offered successful experience. Any substitutions for the telecommunications contractor's key personnel requires approval from the Owner's Representative.

3. Minimum Manufacturer Qualifications

- a. Cabling, equipment and hardware manufacturers shall have a minimum of 3 years experience in the manufacturing, assembly, and factory testing of components which comply with ANSI/TIA/EIA-568-B.1, ANSI/TIA/EIA-568-B.2 and ANSI/TIA/EIA-568-B.3.
- b. Owner requires the contractor to be trained and certified to provide the following minimum manufacturer's warranty:

- (1) Twenty (20) Year extended product warranty. A 20 Year extended product warranty shall ensure against product defects, that all approved cabling components exceed the specifications of TIA/EIA 568B and ISO/IEC IS 11801, and provide an end-to-end solution capable of delivering 10 GB/sec in accordance with the application standards. The warranty shall apply to all passive cabling components. The 20 Year extended product warranty shall cover the replacement or repair of defective product(s) and labor for the replacement or repair of such defective product(s) for a twenty (20) year period.
- (2) Twenty (20) Year application assurance. A 20 Year application assurance shall cover the failure of the wiring system to support the application which it was designed to support, as well as additional application(s) introduced in the future, by recognized standards or user forums that use the TIA/EIA 568B or ISO/IEC IS 11801 component and link/channel specifications for cabling, for a twenty (20) year period.

C. Test Plan

1. Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the UTP and optical fiber components and accessories 45 days prior to the proposed test date. Include procedures for certification, validation, and testing.

D. Designated Supervisor: Provide a designated supervisor present and in responsible charge in the fabrication shop and on the Project Site during all phases of installation and testing of the Work of this Section. This supervisor shall be the same individual through the execution of the Work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.

E. Reference Documents: At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies.

1. A complete set of the latest stamped, actioned submittals of record.
2. A complete set of manufacturer's original operation, instruction and service manuals for each equipment item.

F. Test Equipment

1. Requirements:

- a. Maintain and operate test equipment at the fabrication shop and the job site for both routine and Acceptance Testing of the Work of this Section.
  - b. Maintain test equipment at the job site while work is in progress from installation of equipment racks until Owner Acceptance of this Work; thereafter remove all of this test equipment from the job site.
  - c. Unless otherwise indicated, test equipment shall remain property of the Contractor.
  - d. Provide all required test cables, jigs and adapters.
  - e. Provide equipment with traceable calibration, with calibration date not greater than one year prior to the date of the use of the equipment to perform the specified testing.
2. Equipment: Specified in individual Sections.

#### **1.06 REGULATORY REQUIREMENTS**

- A. Regulations Applicable: Including but not limited to those defined in Division 1.
1. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
  2. Safety Agency Listing: All devices provided under the Work of this Section which are connected to the Project electrical system shall be listed by a Nationally Recognized Testing Laboratory, and shall be so labeled.
  3. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Owner's Representative. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Procedures:
1. In accordance with Division 1 and as specified in the individual sections of Division 27.
- B. General
1. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for telecommunications cabling and equipment placed in storage.

#### **1.08 ENVIRONMENTAL REQUIREMENTS**



- A. Connecting hardware shall be rated for operation under ambient conditions of 32 to 140 degrees F and in the range of 0 to 95 percent relative humidity, non-condensing.

### **1.09 SEQUENCING**

- A. Comply with Division 1, and the following.
  - 1. Reproducibles:
    - a. 1 set of reproducible bond, edgebound.
    - b. CAD DWG files: 1 set.

### **1.10 OPERATING AND MAINTENANCE DATA**

- A. Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance of products provided as a part of the telecommunications cabling and pathway system.
  - 1. Submit operations and maintenance data in accordance with Division 1 and as specified herein not later than 2 months prior to the date of beneficial occupancy.

### **1.11 PROJECT RECORD DOCUMENTS**

- A. Comply with Division 1 and the following.
  - 1. Record Drawings CAD
    - a. Use a computer added drafting (CAD) system in the preparation of record drawings for this Project. CAD system shall produce files in AUTOCAD® DWG format, latest version at time of bid. (Campus Standard, no substitution permitted).
    - b. Except where prohibited by Contract, Architect will furnish CAD DWG backgrounds in AutoCAD® .DWG format, latest version at time of bid, for use by the Contractor in preparing Record Drawings.
    - c. PDF Readable Format. Save the drawings in PDF files.
    - d. Diskette copy of Record Drawings: Provide 2 separate disc copies of each drawing file in the format noted above. Submit on CD-R disk.
    - e. Reproducibles: Provide 2 sets of Bond Paper, edgebound sets.
  - 2. Provide drawings including documentation on cables and termination hardware in accordance with ANSI/TIA/EIA-606-A. The drawings shall include schedules to show information for cut-overs and cable plant management, patch panel layouts and cover plate assignments, cross-connect information and connecting terminal layout as a minimum. Provide the following drawing documentation as a minimum:

- a. Cables - A record of installed cable shall be provided in accordance with ANSI/EIA/TIA-606-A. The cable records shall include the required data fields for each cable and complete end-to-end circuit report for each complete circuit from the assigned outlet to the entry facility in accordance with ANSI/TIA/EIA-606-A. Include manufacture date of cable with submittal.
  - b. Termination Hardware - A record of installed patch panels, cross-connect points, distribution frames, terminating block arrangements and type, and outlets shall be provided in accordance with EIA TIA/EIA-606-A. Documentation shall include the required data fields as a minimum in accordance with EIA TIA/EIA-606-A.
3. Spare Parts
- a. In addition to the requirements of Division 1, provide a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.

#### **1.12 WARRANTY SERVICE**

- A. In addition to provisions of Division 1, provide the following.
1. Response Time: Provide a qualified technician familiar with the work at the Project Site within 24 hours after receipt of a notice of malfunction. Provide the Owner's Representative with telephone number attended 8 hours a day, 5 days a week, to be called in the event of a malfunction.
- B. Provide all additional Warranties as defined in each Communications Systems Section.

#### **1.13 ACCEPTANCE REVIEW AND TESTING PROCEDURES**

- A. Complete all Work of this Section. Submit Test Report. Submit review copies of Operating and Maintenance Manuals, less reduced set of Record Drawings. Notify the Owner's Representative in writing that the Work of these Sections is complete and fully complies with the Contract Documents. Request Acceptance Review and Testing. The Owner's Representative will conduct Verification of Submitted Test Data, and otherwise direct testing and adjustment of this Work. These procedures may be performed at any hour of the day or night as required by the Owner's Representative to comply with the Project Schedule and avoid conflict with Residents. Provide all specified personnel and equipment at any time without claim for additional cost or time.
- B. Personnel: Provide services of the designated supervisor and additional technicians familiar with work of this Section. Provide quantity of technicians as required to comply with Project Schedule.
- C. In Addition, Provide:
1. All tools appropriate for performance of adjustment of and corrections to this Work. Include spare wire and connectors and specified tooling for application.

2. Ladders, scaffolding and/or lifts as required to access high devices.
  3. All test equipment.
  4. Complete set of latest stamped, actioned submittals of record for reference.
  5. Complete set of Test Reports.
  6. Complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.
  7. Demonstrate: Complete operation of all systems and equipment, including Portable Equipment.
  8. Adjust: As directed by the Owner's Representative.
  9. Correct: In timely manner, failure to comply with the Contract Documents, as reasonably determined by the Owner's Representative.
- D. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the Owner's Representative, in place of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven (7) days prior to the scheduled completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.

#### **1.14 CLOSEOUT**

- A. Punch List: Perform any and all remedial work, at no claim for additional cost or time. Where required, retest and submit Test Report. Notify the Owner's Representative of completion of Punch List.
- B. Portable Equipment: Furnish all portable equipment and spares to the Owner's Representative, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packing.
- C. Operating and Maintenance Data: Install framed operating and maintenance instructions. Submit Manuals.
- D. Project Record Documents: Submit print and digital copies. Digital files shall be in CAD system shall produce files in AutoCAD® .DWG format, latest version at time of bid.
- E. Keys: If applicable, replace construction locks with permanent locks. Provide 5 sets of keys to the Owner's Representative.
- F. Instruction: Conduct specified instruction.
- G. Warranty: Submit Warranty dated to run from date of Acceptance of the Work of this Section.

## **PART 2 - PRODUCTS**

### **2.02 GENERAL**

- A. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.
- B. Each material, device or piece of equipment shall comply with all of the manufacturer's current published specifications for that item.
- C. Products shall be made by manufacturers regularly engaged in the production of such products.
- D. Provide quantity as shown on Contract Drawings, or as otherwise indicated.
- E. Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.
- F. Provide the manufacturer's latest design/model, permanently labeled with the manufacturer's name, model number and serial number.
- G. Where products are of similar type or use, provide products of the same manufacturer, unless otherwise indicated.
- H. Components
  - 1. UL or third party certified. Cabling and interconnecting hardware and components for telecommunications systems shall be UL listed or third party independent testing laboratory certified, and shall comply with NFPA 70 and conform to the requirements specified herein.
  - 2. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance.
    - a. The label or listing by the specified organization will be acceptable evidence of compliance.
    - b. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Owner's Representative.

- c. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
  - 3. Products shall provide a complete end-to-end system of connectivity and shall be warranted as a system by the manufacturer.
- I. Enclosures:
  - 1. Provide steel frames and enclosures designed and wired to eliminate all induced currents.
  - 2. Make bolted connections with self-locking devices.
- J. Finishes: Any item or component of the Work of this Section which is visible shall comply with the following.
  - 1. Finishes noted or scheduled on the Contract Drawings take precedence.
  - 2. Where design location requires that products, materials or equipment are visible to the public, no manufacturer's logos larger than 1/2 inch shall be visible. Unless otherwise noted or directed, neatly remove or permanently paint out such logos.
  - 3. Where finishes are not noted or otherwise defined in the Contract Documents, submit manufacturer's standard finish samples for selection by the Owner's Representative.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Examine existing conditions before starting work. Submit conflicts in a timely manner for resolution

**3.02 PREPARATION**

- A. Prepare and sequence the work to minimize disruption to each room environment and existing communications systems.
- B. Protection: Cover all computers, electronic equipment, desks, chairs, furniture and other articles when working at ceiling level and/or performing dust producing tasks.

**3.03 REPAIR AND RESTORATION**

- A. Where working in spaces occupied by the Owner, return to their original positions any furniture or articles relocated to perform the work.

**3.04 CLEANING**

A. Where working in spaces occupied by the Owner:

1. Immediately after completing work within each space, clean up and remove all materials, scrap and dust.
2. All scrap material in work area shall be picked up and removed from the building at the end of each day. See also Division 1 for additional requirements.
3. All dust resulting from work performed shall be vacuumed up daily.
4. All scrap material shall be removed from site and disposed of in an authorized disposal site. Refer to Division 1.

**END OF SECTION**

**SECTION 27 05 29 – COMMUNICATIONS HANGERS AND SUPPORTS**

**PART 1 – GENERAL**

**1.01 SCOPE OF WORK**

A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the provision of communications supports and cable hook system as described in this specification, including but not limited to:

1. Strut supports
2. Cable Hooks (J-hooks)
3. Beam clamps
4. Concrete Fasteners
5. Touch-Up Materials
6. Conduit supports.
7. Equipment supports.
8. Fastening hardware.

B. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1. Section 27 05 00 – Common Work Results for Communications
2. Section 27 05 33 – Conduits and Back boxes for Communications Systems
3. Section 27 05 53 – Identification for Communications Systems
4. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
5. Section 27 11 23 – Communications Cable Management
6. Section 27 15 00 – Communications Horizontal Cabling

## 1.02 SYSTEM DESCRIPTION

- A. Provide devices specified in this Section and related Sections for support of communications equipment specified for this Project.
- B. Provide support systems that are adequate for the weight of equipment, conduit and wiring to be supported.

## 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - 2. ASTM A153/A153M-04 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 3. ASTM B633-98e1 Specification for Electro-deposited Coatings of Zinc on Iron and Steel.
  - 4. ASTM A653/A653M-04a Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. American National Standards Institute (ANSI)
  - 1. ANSI/TIA/EIA-568-B.1-2001, Commercial Building Telecommunications Cabling Standard – Part1: General Requirements
  - 2. ANSI/TIA/EIA-568-B.2-2001, Commercial Building Telecommunications Cabling Standard – Part2: Balanced Twisted Pair Cabling Components
  - 3. ANSI/TIA/EIA-568-B.3-2000, Optical Fiber Cabling Components Standard
  - 4. ANSI/ TIA/ EIA 569-B Commercial Building Standard for Telecommunications Pathways and Spaces
- C. National Fire Protection Association
  - 1. FPA 70, National Electrical Code



**1.04 SUBMITTALS**

- A. Conform with the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications Systems.

**1.05 QUALITY ASSURANCE**

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Cable hooks shall be listed and labeled by Underwriters Laboratories (UL) as required.
- C. Cable hooks shall have the manufacturers name and part number stamped in the part itself for identification.

**PART 2 – PRODUCTS**

**2.01 SUPPORTING DEVICES**

- A. General
  - 1. Supports to be sized to suit load and selected to match mounting conditions.
- B. Manufacturers
  - 1. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
    - a. Concrete fasteners:
      - (1) Phillips "Red-Head".
      - (2) Remington.
      - (3) Ramset. Hilti
      - (4) Simpson Strong-Tie
      - (5) or equal.
    - b. Concrete inserts and construction channel:
      - (1) Unistrut Corp.
      - (2) GS Metals "Globe Strut."
      - (3) Thomas & Betts "Kindorf" Corp.
      - (4) Or equal.

c. Conduit straps:

- (1) O-Z/Gedney.
- (2) Erico "Caddy" Fastening Products.
- (3) Thomas & Betts "Kindorf" Corp.
- (4) Or equal.

d. Beam Clamps

- (1) Cooper B-Line
- (2) SuperStrut
- (3) Unistrut
- (4) or equal

e. Aircraft Cable Sway Braces

- (1) Mason Industries
- (2) M.W. Sausse/Vibrex
- (3) Loos & Company, Inc.
- (4) or equal.

C. Concrete Fasteners

1. Provide expansion-shield type concrete anchors.
2. Provide powder driven concrete fasteners with washers. Obtain approval by Owner's Representative prior to use.

D. Concrete Inserts

1. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of ¼ inch to ½ inch diameter thread for rod support.

E. Aircraft cable sway braces

1. Steel rope sized to meet load.

F. Construction Channel:

1. Construction:

- a. 1-5/8" square galvanized channel formed from U.S.S.G No. 12 or 0.109 inch cold formed steel with 17/32-inch diameter bolt holes, and 1-1/2 inch on center in the base of the channel.
  - b. 10 foot sections.
2. All supporting materials by same manufacturer.
- G. Beam Clamps
1. Malleable iron electro-galvanized steel beam clamps selected to match building structural steel members.
- H. Conduit Straps
1. One hole strap, steel or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.
    - a. Use malleable strap with spacers for exterior and wet locations.
    - b. Use steel strap without spacers for interior locations.
  2. Steel channel conduit strap for support from construction channel.
  3. Steel conduit hanger for pendant support with threaded rod
  4. Steel wire conduit support strap for support from independent #12 gauge hanger wires.
- I. Threaded rods, couplings, screws and nuts:
1. Electrolytically coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.
- J. Miscellaneous Parts
1. Hot dipped galvanized after fabrication; after cutting, de-burring and hole drilling. Coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.
- K. Paint/Tape for Touch-up:
1. Zinc: CRC "Zinc-It", Glyptal, Enterprise Galvanizing "Galambra", or equal.

## 2.02 CABLE HANGERS

### A. Ceiling Hung J-Hooks

1. Drawing Reference(s): as called out j-hook
2. Features/Functions/Construction
  - a. Specifically intended to carry the load of up to 25 communications cables without applying excess forces to cables at bottom of bundle.
  - b. Integral broad bottom edge to spread cable load with flat bottom and provide a minimum of 1-5/8 inch cable bearing surface.
  - c. Integral hanger rod attachment hardware at top.
  - d. Load rated for application.
  - e. Incorporates smooth 90-degree radiused edges to prevent snagging cable jackets on installation.
  - f. Designed so the mounting hardware is recessed to prevent cable damage.
  - g. Integral mechanical cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable.
  - h. Suitable for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.
  - i. Multi-tiered cable hooks to be used where required to provide separate cabling compartments, or where additional capacity is needed.
  
  - j. Finishes:
    - (1) Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.
    - (2) Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.
3. Manufacturer
  - a. Cooper B-Line series BCH21, BCH32, BCH64, BCH-HBA.
  - b. Caddy/Erico CableCat
  - c. or equal.

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. The Owner's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

#### **3.02 EXAMINATION**

- A. Thoroughly examine site conditions for acceptance of supporting device installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.

#### **3.03 PREPARATION**

- A. **Coordinate size**, shape and location of concrete pads required for equipment installation with Base Building General Contractor.
- B. Layout support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.
- C. Where shown on the Drawings or Specifications, install freestanding communications equipment on concrete pads.

#### **3.04 INSTALLATION**

- A. Furnish and install supporting devices as noted throughout the Communications Systems work.
- B. Communications device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.
- C. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using precast inserts, expansion anchors, preset inserts or beam clamps.
- D. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster or gypsum board partitions and walls.
- E. Use expansion anchors or preset inserts in solid masonry walls.

- F. Use self-drilling anchors, expansion anchor, or preset inserts on concrete surfaces.
- G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- H. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or acoustical ceiling suspension wires.
- I. Do not drill structural steel members unless first approved in writing by the Owner's Representative.
- J. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- K. Install surface-mounted cabinets with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.
- L. Bridge studs top and bottom with channels to support flush mounted cabinets and panel boards in stud walls.

### **3.05 ERECTION OF METAL SUPPORTS**

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

### **3.06 WOOD SUPPORTS**

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

### **3.07 ANCHORAGE**

- A. As part of the project submittals, the contractor to provide engineered shop drawings indicating the proposed design for mounting all work of this Division weighing more than 20 pounds, inclusive of mounting systems, and for equipment mounted at the exterior, inclusive of its effective wind load under the range of conditions experience.

1. Shop drawings to be accompanied by anchorage calculations indicating that it shall remain attached to the mounting surface after experiencing forces in conformance with CBC, Volume II, Table 16-O 3.B. "Electrical, Mechanical and Plumbing Equipment and Associated Conduit and Ductwork and Piping" for Seismic Zone 4 Area, Importance Factor of 1.25.
2. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.

### **3.08 DISTRIBUTION PATHWAY VIA CEILING HUNG CABLE HOOKS (J-HOOKS)**

- A. Void, Plenum or Suspended Ceiling Exposed Cable Installation. Where drawings specifically show or permit use of exposed cable installation in voids, conform to the most restrictive requirements of Code, TIA-569-B and this Section.
  
- B. Provide support for all cabling. Do not place or attach directly to T-bar grid, concealed spline grid, flexible or rigid ductwork, HVAC registers, sprinkler piping or fixtures, light fixtures or building structure. Conform to the California Electric Code.
  
- C. Placement:
  1. All pathways created by ceiling hung cable hooks shall be reviewed by the
  2. Owner's Representative prior to installation. Ceiling hung cable hooks and cabling supported by same shall not obscure access to access doors, hatches, air dampers, valves, filter sections, VAV boxes, cable trays, junction boxes, pull boxes or similar areas of access required by other trades.
  3. All ceiling hung cable hooks shall be mounted close enough together such that upon completion of the station cable installation a minimum amount of cable droop occurs between adjacent rings. The distance between supporting rings shall not exceed 48 inches or as required by the current edition of TIA-569-B.
  4. Refer to the separation requirements listed in Section 27 10 00 -Structured Cabling, Basic Materials and Methods for minimum distances from electrical power and other electro-magnetic sources.
  5. All cable hook pathways shall be dedicated for use by voice/data cabling. Any cables required for other low voltage systems shall be routed with a separate suspension system.

**END OF SECTION**

September 29, 2023

Petaluma Regional Library Renovation  
Petaluma, California



## **SECTION 27 05 33 – COMMUNICATIONS CONDUITS AND BACK BOXES**

### **PART 1 - GENERAL**

#### **1.01 SCOPE OF WORK**

- A. Provide telecommunications pathways in accordance with EIA TIA/EIA-569-B, as specified in this Section and as shown on the plans. Provide system furniture pathways in accordance with UL 1286. Provision of all low voltage Communications Systems Pathway and Electronic Security and Safety System Pathway, including:
  - 1. Rigid steel conduit and fittings.
  - 2. C insulated rigid steel conduit and fittings.
  - 3. Intermediate metal conduit and fittings.
  - 4. Electrical metallic tubing and fittings.
  - 5. Miscellaneous conduit fittings and products.
  - 6. Junction Boxes
  - 7. Floor Boxes
  - 8. Hinged cover enclosures.
  - 9. Pullboxes and Terminal Cabinets.
- B. At Hazardous Occupancies, installation conforms to the requirements of California Electric Code for Class and Division rating of spaces.
- C. All conduits and suspension system for conduits for communications cabling shall be dedicated for voice/data cable routing, and shall not be shared with any other cabling system.
- D. Minimum conduit size for telecommunications installation shall be 1 ¼”.

#### **1.02 RELATED WORK IN OTHER SECTIONS**

- A. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
  - 1. Section 27 05 00 – Common Work Results for Communications Systems.
  - 2. Section 27 05 29 – Hangers and Supports for Communications Systems
  - 3. Section 27 05 33 – Conduits and Backboxes for Communications Systems
  - 4. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
  - 5. Section 27 15 00 – Communications Horizontal Cabling

### 1.03 REFERENCES

- A. Usage: In accordance with Division 1.
  - 1. American National Standards Institute (ANSI)
    - a. ANSI C80.1 1994 Rigid Steel Conduit -Zinc Coated
    - b. ANSI C80.3 1991 Electrical Metallic Tubing -Zinc Coated
  - 2. National Electrical Manufacturers Association (NEMA)
    - a. NEMA 250-2003 Enclosures for Electrical Equipment (1000 Volts Maximum)
    - b. NEMA FB 1 (ANSI/NEMA FB 1-2003) Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
    - c. FB 2.10 2000 Selection and Installation Guidelines for Fittings For Use With Non-Flexible Metallic Conduit Or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, And Electrical Metallic Tubing).
    - d. NEMA ICS 6 1988 (Rev. 1) Enclosures for Industrial Control and Systems
    - e. NEMA OS 3-2002 Selection and Installation Guidelines for Electrical Outlet Boxes.
    - f. NEMA RN 1-1998 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
    - g. NEMA TC 7 2000 Smooth Wall Coilable Polyethylene Electrical Plastic Duct
    - h. NEMA TC 13 2000 Electrical Nonmetallic Tubing (ENT).
    - i. NEMA TC 14 1984(R 1986) Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings
  - 3. Underwriters Laboratories, Inc. (UL)
    - a. UL 6 2004 Electrical Rigid Metal Conduit -Steel
    - b. UL 50 (1995; R 1999, Bul. 2001) Enclosures for Electrical Equipment
    - c. UL 514A 1991 (R 2004) Metallic Outlet Boxes
    - d. UL 514B 1989 (R 2004) Conduit, Tubing and Cable Fittings
    - e. UL 514C 1996 (R 2000) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
    - f. UL 6511989 (R 1989) (Bul. 1993) Schedule 40 and 80 Rigid PVC Conduit.
    - g. UL 7971993 (R 2004) Electrical Metallic Tubing -Steel

- h. UL 1242 1983 (R1993) (Bul. 1993) Intermediate Metal Conduit.
- i. UL 1286(1999; R 2001, Bul. 2002) Office Furnishings
- j. UL 1479 Fire Tests of Through Penetration Firestops
- k. UL Fire Resistance Directories

#### **1.04 SUBMITTALS**

- A. Conform with the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications.

#### **1.05 QUALITY ASSURANCE**

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Only products and applications listed in this Section may be used on the project unless otherwise submitted and approved by the Owner's Representative.

### **PART 2 – PRODUCTS**

#### **2.01 GENERAL**

- A. Provide the following types of conduit systems listed by their commonly used generic name.

#### **2.02 RACEWAY**

- A. Manufacturers:
  - 1. Raceway:
    - a. Allied Tube and Conduit Co.
    - b. Triangle PWC, Inc.
    - c. Western Tube and Conduit Corp.
    - d. Spring City Electrical Manufacturing Co.
    - e. Occidental Coating Co. (OCAL).
    - f. Alflex Corp.
    - g. Anaconda.
    - h. Or equal.
  - 2. Fittings:

- a. Appleton Electric Co.
  - b. OZ/Gedney.
  - c. Thomas & Betts Corp.
  - d. Spring City Electrical Manufacturing Co.
  - e. Occidental Coating Co. (OCAL).
  - f. Carlon.
  - g. or equal.
- B. Rigid Steel Conduit.
1. Drawing and Spec Reference: As noted.
  2. Construction:
    - a. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.
    - b. Standard threaded couplings, locknuts, bushings, and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure.
    - c. Three piece couplings: Electroplated, cast malleable iron.
    - d. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150 degree C minimum.
    - e. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.
    - f. Insulated metallic bushings: Threaded cast malleable iron body with plastic insulated throat rated 150 degrees C.
    - g. All fittings and connectors shall be threaded.
- C. Coated Rigid Steel Conduit:
1. Drawing and Spec Reference: As Noted.
  2. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and NEMA RN-1 with nominal 40 mil thermoplastic vinyl coating, heat fused and bonded to the exterior of the conduit.
  3. Fittings:
    - a. Conduit couplings and connectors shall be as specified for galvanized rigid steel conduit and shall be factory PVC coated with an insulating jacket equivalent to that of the coated material.

- b. Fittings over-sleeve to extend 1 conduit diameter or 1-1/2" beyond fitting, whichever is less.
    - 4. Performance:
      - a. Tensile Strength: 3500 psi.
    - 5. Approvals:
      - a. NEMA RN1 (Type 40 -40 mils thick)
      - b. CalTrans Type 2
    - 6. Manufacturers:
      - a. Plastibond by RobRoy Industries.
      - b. Occal-40 by Occidental Coating Company.
      - c. KorKap by Plastic Applicators.
      - d. Ocal-Blue
      - e. or equal.
  - D. Intermediate Metal Conduit
    - 1. Drawing Reference: As Noted
    - 2. Conduit: Hot dip galvanized steel meeting the requirements of CEC Article 345 and conforming to ANSI C80.6 and UL 1242.
    - 3. Fittings: Conduit couplings, connector and bushing shall be as specified for galvanized rigid steel conduit. Integral retractable type IMC couplings are also acceptable.
  - E. Electrical Metallic Tubing.
    - 1. Drawing and Spec Reference: As Noted.
    - 2. Conduit: Shall be formed of cold rolled strip steel, electrical resistance welded continuously along the longitudinal seam and hot dip galvanized after fabrication. Conduit shall conform to ANSI C80.3 specifications and shall meet UL classifications.
    - 3. Set screw type couplings: Electroplated, steel or cast malleable iron, UL listed concrete tight. Use set screw type couplings with four setscrews each of conduit sizes over 2 inches. Setscrews shall be of case hardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding.
    - 4. Set screw type connectors: Electroplated steel or cast malleable iron UL listed concrete tight with male hub and insulated plastic throat, 150 degree C temperature rated. Setscrew shall be same as for couplings.

5. Raintight couplings: Electroplate steel or cast malleable iron; UL listed raintight and concrete tight, using gland and ring compression type construction.
6. Raintight connectors: Electroplated steel or cast malleable iron, UL listed raintight and concrete tight, with insulated throat, using gland and ring compression type construction.

### **2.03 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS**

#### **A. General**

1. UL 514B.
2. Listed in UL Electrical Construction Materials List.

#### **B. Conduit Fittings, Insulated Throat Grounding Bushings**

##### **1. Description**

- a. Threaded for Rigid Steel Conduit and Intermediate Metal Conduit.
- b. UL Listed for use with copper conductors.
- c. Thermoplastic insulated liner for 105 degrees Celsius.
- d. Body of malleable iron, zinc plated; or die cast zinc.

##### **2. Manufacturer**

- a. Thomas & Betts (Steel City) BG-801 Series
- b. O-Z/Gedney
- c. or equal.

C. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.

D. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.

E. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.

F. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling shall accommodate .75-inch deflection, expansion, or contraction in any

direction, and allow 30-degree angular deflections. Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber jacket and stainless steel jacket clamps. Unit shall comply with UL467 and UL514.

1. Manufacturer:
  - a. OZ/Gedney Type DX
  - b. Steel City Type EDF
  - c. or equal.
- G. Fire rated penetration seals:
  1. UL classified.
  2. Conduit penetrations in fire rated separation shall be sealed with a UL classified assembly consisting of fill, void or cavity materials.
  3. The fire rated sealant material shall be the product best suited for each type of penetration, and may be a caulk, putty, composite sheet or wrap/strip.
  4. Penetrations of rated floors shall be sealed with an assembly having both F and T ratings at least equal to rating of the floor.
  5. Penetrations of rated walls shall be sealed with an assembly having an F rating at least equal to the rating of the wall.
- H. Standard products not herein specified:
  1. Submit for review a listing of standard electrical conduit hardware and fittings not herein specified prior to use or installation, i.e. locknuts, bushings, etc.
  2. Listing shall include manufacturers name, part numbers, and a written description of the item indicating type of material and construction.
  3. Miscellaneous components shall be equal in quality, material, and construction to similar items herein specified.
- I. Hazardous area fittings: UL listed for the application.

## **2.04 JUNCTION AND DEVICE BOXES**

- A. Junction and Device Boxes
  1. Drawing References: As Noted
  2. Construction:
    - a. Concealed/Flush Mounted:
    - b. One or two piece welded knockout boxes.
    - c. UL 514A, cadmium or zinc-coated 1.25 oz/sq. ft., if ferrous metal.

- d. Pressed sheet steel, for indoor locations.
  - e. UL 514C approved if non-metallic.
  - f. At hollow masonry, tile walls and plaster walls, provide with device rings as required.
  - g. Surface mounted:
    - (1) Exterior -Conform to the Junction and/or PullBox construction scheduled on the Plans. Where construction not otherwise scheduled or noted on the plans, conform to the following:
      - (a) Cast iron or aluminum with threaded hubs and mounting lugs.
      - (b) Gasketed cover with spring lid.
    - (2) Concrete floor embedded:
      - (a) Cast iron concrete pour boxes with screwed brass cover, unless otherwise noted.
      - (b) Cadmium plated screw cover attachment at least 6" on center.
  - h. Minimum box size shall be at least 4 11/16" deep boxes.
  - i. Provide complete with approved type of connectors and required accessories, including attachment lugs or hangers. Provide raised device covers as required to accept scheduled device.
3. Approvals.
- a. UL 514A
4. Manufacturers:
- a. Interior:
    - (1) Steel City.
    - (2) Bowers
    - (3) or equal.
  - b. Exterior, exposed with cover of same construction.
    - (1) Appleton
    - (2) Pyle-National
    - (3) or equal.
  - c. Other conditions:
    - (1) Any meeting approvals and requirements.



## **PART 3 – EXECUTION**

### **3.01 CONDUIT APPLICATION**

- A. General: Install the following types of conduits and fittings in the locations listed, unless otherwise noted in the drawings:
  - 1. Exterior, Exposed:
    - a. Rigid Steel Conduit for applications up to 8 feet AFF or to first pull box, whichever is first, applications subject to physical abuse or for applications greater than 4" diameter.
  - 2. Interior, Exposed, Wet and Damp Locations:
    - a. Rigid Steel Conduit.
    - b. At interior locations over 8 feet above finished floor, EMT acceptable.
  - 3. Interior, Hazardous Locations
    - a. Rigid Steel Conduit
    - b. Intermediate Metallic Conduit, where permitted by the CEC.
  - 4. Interior, exposed or concealed, dry locations:
    - a. Rigid Steel Conduit, if subject to physical abuse.
    - b. Electrical Metallic Tubing, if not subject to physical abuse.
  - 5. Interior, concealed, damp locations, including in masonry walls.
    - a. Rigid Steel Conduit
  - 6. Embedded in Concrete
    - a. Rigid Steel Conduit or rigid non-metallic conduit.
    - b. PVC Type DB-120.
  - 7. Transition from walls to open plan furniture systems:
    - a. Liquidtight

### **3.02 GENERAL REQUIREMENTS**

- A. Refer to the manufacturer's instructions and conform thereto.
- B. Distribution Pathway via Electrical Metallic Tubing Raceway:
  - 1. The EMT conduit is to be installed meeting the NEC handbook Article 348 Installation Specifications.
  - 2. Provide escutcheon plates for all through wall conduit stubs.

3. All ends of conduits shall be cut square, reamed and fitted with insulated bushing.
4. All conduits which pass through fire walls shall be sealed with fire stop putty after all station wire has been installed.

### **3.03 MOUNTING AND INSTALLATION – DEVICE BOXES**

- A. Conform to the more restrictive of NEMA OS 3-2002 and the following.
- B. Provide back boxes at all communications systems devices. Installation of device plates directly to wall surface without use of a back box, unless specifically directed on plans, is unacceptable.
- C. The distance between pull boxes shall not exceed 150 feet or more than two 90 degree bends.
- D. Align boxes plumb with floor and surrounding construction. At door frames, locate 4" from frame. Verify placement with Owner's Representative details to ensure that box clears all trim, etc.
- E. Support and fasten boxes securely. At stud walls use rigid bar hangers, attached to hanger with stud and nut.
- F. At existing locations, provide cutting, patching and finishing as required to maintain or restore finishes so that resulting installation is integrated into the Architectural decor of the particular location.
- G. Mounting Height: the mounting height of a wall-mounted outlet box is defined as the height from the finished floor to the horizontal center line of the cover plate.
- H. Mount outlet boxes with the long axis vertical. Three or more gang boxes shall be mounted with the long axis horizontal.
- I. Install wiring jacks and outlet devices only in boxes which are clean; free from excess building materials, dirt, and debris.
- J. Install wiring jacks and outlet devices after wiring work is complete.

### **3.04 TERMINAL CABINETS, JUNCTION BOXES AND PULL BOXES**

- A. General
  1. Thoroughly examine site conditions for acceptance of cabinets and enclosures installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.
- B. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.

- C. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with standards referenced in Section 27 05 29.
- D. "Train" interior wiring, bundle and clamp using specified plastic wire wraps. Separate power and signal wiring.
- E. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- F. Terminate conduit in cabinet with lock nut and grounding bushing.
- G. Cleaning
  - 1. Touch-up paint any marks, blemishes or other finish damage suffered during installation.
  - 2. Vacuum clean cabinet on completion of installation.

### **3.05 SUPPORT**

- A. Provide supports for raceways as specified in Section 27 05 29 – Hangers and Supports for Communications Systems.
- B. All raceways installed in exposed dry locations shall be grouped in a like arrangement and supported by means of conduit straps, wall brackets or trapeze hangers in accordance with Code and the requirements of the this Section and Section 27 05 29 – Hangers and Supports for Communications Systems. Fasten all hangers from the building structural system.
- C. Provide supports and mounting attachments per the most restrictive of Code and the following.
- D. Install no more than one coupling or device between supports.
- E. Conduit support
  - 1. As specified in Section 27 05 29 – Hangers and Supports for Communications Systems
- F. The Owner's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

### **3.06 PENETRATIONS**

- A. Gypsum Wall Board Penetrations: Provide circular penetrations maximum 1/8" inch larger than outer diameter of conduit being used. On both sides of the wall fill space between conduit and wall with joint compound, depth to match gypsum board thickness.
- B. Install UL listed fire-stop system whenever a raceway penetrates a firewall in conformance with the manufacturer's directions, the published systems assembly

requirements, CBC Section 709 and 710 and CEC 300-21, whichever is the most restrictive. At cable tray penetrations, provide pillow type removable fire stop per CBC Section 709 and 710, the published systems assembly requirements and the manufacturer's directions, whichever is the most restrictive.

- C. All communications systems conduit openings in walls and floors are the responsibility of the Contractor. Install sleeves shown on the drawings when the concrete is poured. Any openings required after the concrete has set maybe core drilled.

**3.07 RACEWAY INSTALLATION, GENERAL**

- A. Raceway runs are shown schematically. Install concealed unless specifically shown otherwise. Supports, pull boxes, junction boxes and similar generally not indicated. Provide where designated.
  - 1. Install exposed conduit and raceway parallel and perpendicular to nearby surfaces or exposed structural members, and follow the surface contours. Level and square conduit and raceway runs.
  - 2. Raceway runs shall be mechanically and electrically continuous between all each equipment rack and utility demarcation point, receptacle and/or surface raceway strip, as applies.
  - 3. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box, or outlet by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter.
  - 4. Bends
    - a. All bends or elbows shall have a minimum radius as follows

Conduit Size	Min. Radius (Inches)
1-1/4"	18
2"	24
2-1/2"	24
3"	30
3-1/2"	30
4"	30
5"	36
6"	42

- b. Use factory elbows or machine bends for conduit bends 1-1/4" and larger.

5. Make bends and offsets so the inside diameter is not effectively reduced. Make bends in parallel or banked runs from the same center line so that the bends are parallel.
  6. Install at least one (1) 3/8", 200 pound strength nylon pull cord in all empty raceways.
  7. Raceways crossing building expansion joints or in straight runs exceeding 100 feet shall be provided with UL listed expansion fittings.
  8. Install conduit seals and drains to prevent accumulated moisture in conduits from entering Communications System enclosures.
  9. Conduit fill shall not exceed 40% of the conduit's cross-sectional area.
- B. Do not install conduit in concrete slabs unless specifically directed by Owner's Representative. Embedded conduits in concrete slab walls, and columns shall be installed in center third between upper and lower layers of reinforcing steel as directed by the Owner's Representative. Space conduits 8" on center except at cabinet locations where slab thickness shall be increased as directed by the Owner's Representative.
- C. All conduits to be kept 12" away from steam or hot water lines. Install horizontal conduit and raceway runs below water and steam piping.
- D. Conduit dropping down to equipment shall be as straight as possible without any offsets, parallel or perpendicular to walls, ceilings and other building features.
- E. Conduit installed on any equipment shall be run symmetrical with the equipment and in such a manner as to:
1. Not to be exposed to damage;
  2. Not interfere with access to components of the equipment that will interfere with maintenance operation or;
  3. Not to be in a manner that the Owner deems detrimental to its operation.
- F. Whenever an installation such as that listed occurs, the Contractor shall make all necessary changes at no additional cost to the Owner.
- G. All cut ends of conduit, scratches, tool marks, etc. on any metallic raceway installed in the ground or on the exterior of the building shall be treated with two coats of specified Touch Up Paint/Tape.
- H. Exposed conduit and metallic surface raceway installed in finished spaces shall be painted to match surrounding surfaces using paint and methods directed by the Owner's Representative.
- I. All raceways stubbing up into equipment or racks shall be sealed. Raceways with conductors shall be plugged with duct-seal. Spare raceways shall be capped. Prevent foreign matter from entering conduit and raceway; use temporary closure protection. Replace conduits containing concrete, varnish or other foreign material.

- J. Complete installation of conduit and raceway runs before starting installation of cables/wires within conduit and raceway.
- K. Use specified conduit and raceway fittings that are of types compatible with the associated conduit and raceway and suitable for the use and location. Join and terminate conduit and raceway with fittings designed and approved for the purpose of the conduit and raceway system and make up tight.
- L. Where chase nipples are used, align the raceway and coupling square to the box and tighten the chase nipple so no threads are exposed.
- M. Horizontal conduit or EMT runs, where required and permitted, shall be installed as close to ceiling or ceiling beams as practical.
- N. Conduit and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes or radiator branches.
- O. Conduit and EMT shall not be run through beams, purlins or columns except where permission is granted by Owner's Representative in writing.
- P. Bond installed metallic raceway in accordance with the requirements of the CEC.

**3.08 REUSE OF EXISTING CONDUIT**

- A. Existing conduit is to be used as a pathway only where so shown on the drawings.
- B. Prior to beginning work involving the use of an existing conduit, the Contractor shall consult with the Owner's Representative in order to establish whether or not the conduit contains active service.
- C. If no active service exists within the conduit, all cable is to be removed, and work is to proceed.
- D. If active service does exist within the conduit and it has been determined that service needs to be disrupted, then work on that conduit shall not proceed until a schedule of service outage has been established by Owner's Representative. Once given permission to proceed, the Contractor shall within the time period of one (1) working day; remove the old cable, install, terminate and test the new cables, and notify the Owner's Representative the work using the specific conduit has been completed. The Owner's Representative shall be responsible for the disconnection and reconnecting of the active service cross-connects within the terminal closet(s).
- E. Conduit preparation procedure:
  - 1. Remove existing Wires and Cables (if any).

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2. Run a mandrel ½" smaller than the inside diameter of the conduit through the conduit receiving new wires and cables.
3. If the specified size mandrel will not pass through the existing conduit, start with a smaller size mandrel and increase mandrel size until the specified sized mandrel will pass.
4. Run a wire brush and clean rag with an outside diameter 1/8" larger than the inside of the conduit through the conduit receiving new wires and cables.
5. Repeat above until conduit is clean and materials detrimental to the wire and cables to be installed no longer exit conduit with the clean rag.

**END OF SECTION**

## SECTION 27 05 53 – IDENTIFICATIONS FOR COMMUNICATIONS

### PART 1 – GENERAL

#### 1.01 SUMMARY

- A. Provide all labor, materials, tools, and equipment required for permanent intelligible labeling on, or adjacent to, all cabling, connectors, innerduct, faceplates, jacks, receptacles, controls, fuses, circuit breakers, patching jacks, and racks.
- B. This section includes minimum requirements for the following:
  - 1. Labeling Communications Cabling
  - 2. Labeling Closet Hardware
  - 3. Labeling Pathways, Spaces, Grounding and Bonding.
- C. Refer to detailed plans for additional requirements.
- D. Clearly and distinctly indicate the function of the item.
- E. Coordinate with Record Drawings

#### 1.02 REFERENCES

- A. Usage: In accordance with Division 1.
- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM D 709(2001) Laminated Thermosetting Materials
- C. Electronic Industries Alliance (EIA)
  - 1. EIA TIA/EIA-606-A (2002) Administration Standard for Commercial Telecommunications Infrastructure (ANSI/TIA/EIA-606)
- D. Underwriters Laboratories (UL)
  - 1. L 969 (1995; R 2001) Marking and Labeling Systems

#### 1.03 RELATED WORK: CONSULT ALL OTHER SECTIONS, DETERMINE THE EXTENT AND CHARACTER OF RELATED WORK AND PROPERLY COORDINATE WORK SPECIFIED HEREIN WITH THAT SPECIFIED ELSEWHERE TO PRODUCE A COMPLETE INSTALLATION.

- A. Section 27 05 00 – Common Work Results for Communications Systems.
- B. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- C. Section 27 11 19 – Communications Termination Blocks and Patching



- D. Section 27 15 00 – Communications Horizontal Cabling

**1.04 QUALITY ASSURANCE**

- A. Identification and administration work specified herein shall comply with the applicable requirements of:

1. ANSI/TIA/EIA – 606-A Administration Standards.
2. ANSI/TIA/EIA – 569B Pathway and Spaces
3. ANSI/TIA/EIA – 568B Telecommunications Cabling Standard.
4. BICSI Telecommunications Distribution Methods Manual.
5. UL 969 (1995; R 2001) Marking and Labeling Systems.

**1.05 SUBMITTALS**

- A. Conform to the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Procedures: In accordance with Division 1.

**1.07 SEQUENCING**

- A. Not Used.

**PART 2 – PRODUCTS**

**2.01 COMMUNICATION CABLING LABELS, INTERIOR**

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Provide vinyl substrate with a white printing area and black print. If cable jacket is white, provide cable label with printing area that is any other color than white, preferably orange or yellow – so that the labels are easily distinguishable.
- D. Shall be flexible vinyl or other substrates to apply easy and flex as cables are bent.
- E. Shall use aggressive adhesives that stay attached even to the most difficult to adhere to jacketing.
- F. Manufacturers:
  1. Cable Type – 4 pair UTP

- a. Brady TLS2200 labels – PTL-31-427,PTL-32-427
  - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
  - c. Hubbell
  - d. Leviton
  - e. Panduit.
  - f. or equal.
2. Cable Type – 4 pair STP
- a. Brady TLS2200 labels – PTL-21-427
  - b. Brady Laser tab labels – LAT-19-361
  - c. Hubbell
  - d. Leviton
  - e. Panduit.
  - f. or equal.
3. Cable Type – 25 pair copper
- a. Brady TLS2200 labels – PTL-21-427
  - b. Brady Laser tab labels – LAT-19-361
  - c. Panduit.
  - d. or equal.
4. Cable Type – 50 pair copper
- a. Brady TLS2200 labels – PTL-33-427
  - b. Panduit.
  - c. or equal.
5. Cable Type – 100 pair copper
- a. Brady TLS2200 labels – PTL-34-427
  - b. Brady
  - c. Panduit.
  - d. or equal.
6. Cable Type – 2 strand fiber

- a. Brady TLS2200 labels – PTL-19-427
  - b. Brady Laser tab labels– LAT-17-361
  - c. Panduit.
  - d. or equal.
7. Cable Type – 4-12 strand fiber
- a. Brady TLS2200 labels – PTL-21-427
  - b. Brady Laser tab labels – LAT-19-361
  - c. Panduit.
  - d. or equal.
8. Cable Bundles
- a. Brady TLS2200 labels – PTL-12-109
  - b. Panduit.
  - c. or equal.

## **2.02 COMMUNICATIONS CABLE LABELS, OUTSIDE PLANT**

- A. Cable Tags in Manholes, Handholes, and Vaults
- 1. Provide tags for communications cable or wire located in manholes, handholes, and vaults.
    - a. The tags shall be polyethylene.
    - b. Machine printed -Do not provide handwritten letters.
  - 2. Polyethylene Cable Tags
    - a. Provide tags of polyethylene that have an average tensile strength of 3250 pounds per square inch; and that are 0.08 inch thick (minimum), non-corrosive non-conductive; resistive to acids, alkalis, organic solvents, and salt water; and distortion resistant to 170 degrees F.
    - b. Provide 0.05 inch (minimum) thick black polyethylene tag holder.
    - c. Provide a one-piece nylon, self-locking tie at each end of the cable tag.
    - d. Ties shall have a minimum loop tensile strength of 175 pounds. The cable tags shall have black block letters, numbers, and symbols one inch high on a yellow background.
    - e. Letters, numbers, and symbols shall not fall off or change positions regardless of the cable tags' orientation.

3. Manufacturers:
  - a. Panduit
  - b. Brady
  - c. or equal.

### 2.03 CLOSET HARDWARE LABELS

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Where insert type labels are used provide clear plastic cover over label.
- D. Manufacturer:
  1. Copper Patch Panels
    - a. 4 port group
      - (1) Brady Laser tab labels – 2.8" x 0.375" LAT-43-707
      - (2) Hubbell XPLPPA series
      - (3) Leviton
      - (4) Panduit.
      - (5) or equal.
    - b. 6 port group
      - (1) Brady Laser tab labels – 3.6" x 0.375", LAT-44-707
      - (2) Hubbell
      - (3) Leviton
      - (4) Panduit.
      - (5) or equal.
    - c. Individual port
      - (1) Brady
        - (a) TLS2200 labels – 0.5" x 0.375" white, PTL-44-422
        - (b) Laser tab labels – 0.5" x 0.375" white, LAT-45-707

- (c) TLS2200 labels – 0.5" x 0.375" clear, PTL-44-430
- (d) Laser tab labels – 0.5" x 0.375" clear, LAT-45-712
- (e) TLS2200 labels – 0.5" x 0.5" white, PTL-7-422
- (f) Laser tab labels – 0.5" x 0.5" white, LAT-46-707
- (g) TLS2200 labels – 0.5" x 0.5" clear, PTL-7-430
- (h) Laser tab labels – 0.5" x 0.5" clear, LAT-46-712
- (2) Hubbell
- (3) Leviton
- (4) Panduit.
- (5) or equal
- d. Patch Panel Name Label.
  - (1) Hubbell XOLPPID Series
  - (2) Brady
  - (3) Leviton
  - (4) Panduit
  - (5) or equal.
- 2. Non-keystone based fiber patch panels
  - a. Hubbell XPLFOSEPAW
    - (1) Brady
    - (2) Leviton
    - (3) Panduit
    - (4) as provided with Patch Panel by the manufacturer
    - (5) or equal.
- 3. 110 blocks
  - a. Brady Laser tab labels – 7.9" x 0.475" (200.6mm x 12.07mm), LAT-177-124
  - b. Hubbell XPL110 series.
  - c. Leviton
  - d. Panduit.
  - e. or equal.

**2.04 GROUNDING AND BONDING, PATHWAY, AND SPACE LABELS**

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Manufacturers:
  - 1. Brady Corporation
    - a. TLS2200 labels
      - (1) PTL-20-422, Size 2.0" x 1.0"
      - (2) PTL-22-422, Size 3.0" x 1.0"
      - (3) PTL-37-422, Size 3.0" x 1.9" PTL-23-422, Size 4.0" x 1.0"
      - (4) PTL-38-422, Size 4.0" x 1.0"
    - b. Laser tab labels
      - (1) LAT-13-747, Size 1.875" x 0.833"
      - (2) LAT-24-747, Size 1.75" x 1.0"
      - (3) LAT-32-747, Size 3.0" x 0.9 "
      - (4) LAT-33-747, Size 2.0" x 1.437"
      - (5) LAT-34-747, Size 3.0" x 1.437"
    - c. Continuous tape for TLS2200
      - (1) PTL-8-422, Size 0.5" white polyester
      - (2) PTL-8-430, Size 0.5" clear polyester
      - (3) PTL-8-439, Size 0.5" white vinyl
      - (4) PTL-42-439, Size 1.0" white vinyl
      - (5) PTL-43-439, Size 1.9" white vinyl
  - 2. Panduit.
  - 3. or equal.

**2.05 NAMEPLATES**

- A. Field Fabricated Nameplates
  - 1. Features/Function/Construction
    - a. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified or as indicated on the drawings.

- b. Comply with ASTM D 709.
- c. Each nameplate inscription shall identify the function and, when applicable, the position.
- d. Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core.
- e. Surface shall be matte finish.
- f. Corners shall be square.
- g. Accurately align lettering and engrave into the core.
- h. Minimum size of nameplates shall be one by 2.5 inches.
- i. Lettering shall be a minimum of 0.25 inch high normal block style

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. Apply labeling to clean surfaces free of oil, dust, solvents or loose material.
- B. Apply after Project painting in area of application is complete.
- C. Apply to locations where labeling will not be damaged, covered over or in the way of the ordinary maintenance and operation of the installed communications infrastructure or system.
- D. Apply labeling right side up, parallel to major edges of surfaces to which it is applied. When no line is evident, apply parallel to floor line. Correct conditions of labeling applied out of true.
- E. Protect installed labeling from damage.
- F. Replace labeling that is defaced, illegible or peeling off of the surface to which it is applied.

#### **3.02 WORKSTATION JACK, CABLE AND PATCH PANEL ASSIGNED CIRCUIT NUMBERS**

- A. The Owner may provide the Contractor copies of the Contract Drawings showing station outlets with Owner assigned data & voice jack ID numbers, should specific labeling be required. Label all installed work according to this master set. Contractor shall coordinate numbering schema with Owner during the shop drawing phase of the project.
- B. The cover plate area directly above and beneath the jacks are the labeling areas. In the top area, using the specified means, label the faceplate number assigned on the contract documents.

### 3.03 IDENTIFICATION & LABELING

#### A. Pathways

1. Pathways shall be marked at each endpoint and at all intermediate pull or junction boxes. In the case of partitioned pathways (i.e. innerduct) each partition shall have a unique identifier.
2. Label pathways using the appropriate abbreviation and a number.
3. Use adhesive type labels.

#### B. Labels shall be affixed at the entry to all telecommunications rooms and spaces (Includes entrance facilities, communication equipment rooms, communication equipment spaces and work areas)

1. Use adhesive type labels for all communications space labeling,
2. Affix labels to entrance doors – coordinate location with Owner's Representative.

#### C. Cables

1. Horizontal and Indoor Backbone Cables shall be marked within 12" of each endpoint or to innerduct in which the cable is installed.
2. Except where installed in innerduct or conduit, all backbone fiber optic cable shall have affixed to the outer jacket, labels of a bright color that contain at least the legend "FIBER OPTIC CABLE." These labels must be affixed at separations no greater than 10 ft.
3. Within every manhole/vault/pullbox and within 4 ft of the entrance into a building every backbone cable's assigned identifier shall be affixed to either the cable's outer jacket or to innerduct in which the cable is installed.
4. Any cable installed in conduit shall be labeled at all intermediate pull or junction boxes.
5. Label cables using the appropriate circuit ID.
6. Use adhesive type labels for all communications cable labels.
7. Affix labels to cables – marking cable is not permitted.
8. Where cable is fully encased in innerduct label the outside of the innerduct with the cable label and, where the contents are fiber optic cabling, the "FIBER OPTIC CABLE" label.

#### D. Patch Panels

1. Fiber patch panels shall be marked using adhesive labels indicating the range of circuits installed to it. All fiber optic cable patch panels shall be labeled with both
2. The pair count of every fiber pair, the cable's assigned identifier, and where shown on the plans, the patch panel's assigned identifier.



3. If not shown on the Contract Documents, Owner's Representative will provide specific circuit ID information.
  4. Category rated patch panels shall be labeled with an identifier, individual ports shall be labeled to indicate circuit and identification of station plate in which the circuit terminates.
- E. 110 blocks
1. Each cable termination position on 110 blocks shall be labeled with number designators.
  2. All backbone copper cable termination blocks shall be labeled with both the pair count of every 5th pair and the cable's assigned identifier.
  3. Where insert type labels are used install clear plastic cover over reprinted or Laser printed type label.
- F. Grounding and Bonding
1. The TMGB(s) (telecommunications main ground bar) shall be labeled as such with an adhesive type label(s) affix label(s) to TMGB.
  2. The conductor connecting the TMGB (telecommunications main ground bar) to the building ground shall be labeled at each end with an affixed label in a visible location as close as practicable to the bonding point at each end of the conductor.
- G. Firestopping
1. Each firestopping location shall be labeled at each location where firestopping is installed, on each side of the penetrated fire barrier, within 12 in. of the firestopping material.

**END OF SECTION**

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## **SECTION 27 10 00 – STRUCTURED CABLING, BASIC MATERIALS AND METHODS**

### **PART 1 – GENERAL**

#### **1.01 SCOPE OF WORK**

- A. This Section defines common means and methods for the work of the following Sections:
  - 1. Section 27 11 19 – Communications Termination Blocks and Patch Panels
  - 2. Section 27 11 23 – Communications Cable Management
  - 3. Section 27 15 00 – Communications Horizontal Cabling

#### **1.02 RELATED DOCUMENTS**

- A. Section 27 05 00 – Common Work Results for Communications Systems applies to the work of this Section.

#### **1.03 REFERENCES**

- A. Usage: In accordance with Division 1.
- B. In Addition to the requirements of Section 27 05 00 – Common Work Results for Communications Systems, conform to the applicable portions of the following standards agencies:
  - 1. American Society for Testing and Materials (ASTM)
    - a. ASTM A228/A228M-02 Steel Wire, Music Spring Quality.
  - 2. Bellcore
    - a. TR-NWT-000253 Intermediate Reach, 1, OC3
  - 3. Telecommunications Industry Association/Electronic Industries Association (TIA/EIA) Telecommunications Industry Association/Electronic Industries Association (TIA/EIA)
    - a. TIA/EIA-455-B Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and other Fiber Optic Components (ANSI/TIA/EIA-455-B-98) Oct. 1998
    - b. TIA/EIA-455-1-BFOTP1 -Cable Flexing for Fiber Optic Interconnecting Devices (ANSI/TIA/EIA-455-1B-98) Oct. 1998
    - c. TIA/EIA-455-2-CFOTP2 -Impact Test Measurements for Fiber Optic Devices (ANSI/TIA/EIA-455-2C-98) Jul. 1998

- d. TIA/EIA-455-3-AFOTP3 -Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components (May 1989)
- e. TIA/EIA-455-5-CFOTP5 -Humidity Test Procedure for Fiber Optic Components (ANSI/TIA/EIA-455-5C-2002)
- f. TIA/EIA-455-7FOTP7 -Numerical Aperture of Step-Index Multimode Optical Fibers by Output Far-Field Radiation Pattern Measurement (ANSI/TIA/EIA-455-7-92) Dec. 1992

#### **1.04 DEFINITIONS**

- A. Unless otherwise specified or indicated, electrical and electronics terms used in this specification shall be as defined in
  - 1. EIA TIA/EIA-568-B.1,
  - 2. EIA TIA/EIA-568-B.2,
  - 3. EIA TIA/EIA-568-B.3,
  - 4. EIA TIA/EIA-569-B,
  - 5. EIA TIA/EIA-606-A and
  - 6. IEEE Std 100 and in this Section.

#### **1.05 SUBMITTALS**

- A. Conform with the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications Systems.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Comply with requirements of Division 1, Section 27 05 00 – Common Work Results for Communications Systems and the following:
- B. Shipping Conditions:
  - 1. All cable shall be shipped on reels or manufacturer supplied “handy boxes”.
  - 2. The diameter of the drum shall be at least 13 times the diameter of the cable.
  - 3. The reels shall be substantial and so constructed as to prevent damage during shipment and handling.
  - 4. Secure the outer end of the cable to the reel head so as to prevent the cable from becoming loose in transit.
  - 5. Project the inner end of the cable into a slot in the side of the reel, or into a housing on the inner slot of the drum, in such a manner and with sufficient length to make it available for testing.

6. The inner end shall be fastened so as to prevent the cable from becoming loose during installation. End seals shall be applied to each of the cables to prevent moisture from entering the cable.

C. Storage:

1. Retain factory cable protection until installation. Supplement with heavy gauge plastic sheeting if factory protective membrane is pierced prior to installation. Tape ends and seams water and dust tight.
2. The reels with cable shall be suitable for outside storage conditions when the temperature ranges from minus 40 degrees C to plus 65 degrees C, with relative humidity from 0 to 100 percent.
3. Protect cable reels from physical damage from site construction vehicles or from settling into the soil.
4. Equipment, other than cable, to be delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variation, dirt and dust, or other contaminants.

**1.07 SEQUENCING**

- A. Not Used.

**1.08 PERFORMANCE STANDARDS**

A. Voice Copper Plant:

1. To USOC Standards. The voice cabling plant provided will be directly connected to the Public Switched Network in accordance with the rules set forth by the FCC Part 68 and other appropriate authorities.
2. Where specified termination jack is indicated as Cat. 6A RJ-45, and specified distribution cabling similarly specified as Cat. 6A, conform to category 6A standards below.

B. Fiber Optic Cabling:

1. Optical Budget, any end to end link -not to exceed the sum of the following:
  - a. The specified cable performance, pro-rated for total link distance.
  - b. Multimode:
    - (1) 0.03 dB for each fusion splice
    - (2) 0.3 dB for each mechanical splice
    - (3) 0.4 dB for each SC connector

- c. Single Mode:
  - (1) 0.06 dB for each fusion splice
  - (2) 0.5 dB for each mechanical splice
  - (3) 0.4 dB for each SC connector

## 1.09 TESTING

### A. General

- 1. Test and report on each intermediate cabling segment separately, including station cabling, horizontal distribution (each segment, if multiple) and telecommunications room wiring.
- 2. Test each end to end cable link.
- 3. Submit machine-generated documentation and raw data of all test results on Contractor-provided, and Owner's Representative approved, forms; and in electronic format approved by the Owner's Representative.
- 4. Provide machine-generated data on an appropriate disk media (CD-ROM CD-R format) to be transferred to the Owner's computers.
  - a. Where the machine-generated documentation requires use of a proprietary computer program to view the data, provide the Owner with 1 licensed copy of the software.
- 5. Provide registered testing software used for the actual tests to the Owner for review of test data.

### B. Test Equipment:

- 1. Provide in conformance with the applicable requirements of 27 05 00 -Common Work Results for Communications Systems.
- 2. Test systems using at least one (1) each of the following test measurement devices or their functional equivalents:
  - a. Outside Plant Voice Cabling Plant tester -capable of detecting shorts, opens, reversals, mis-wiring and cross twists. (Siemon STM-8, Fluke or equal).
  - b. Tone Test Sets.
  - c. Optical power meter (HP, Corning Cable Systems, Fluke or equal).
  - d. Site portable communications systems (walkie-talkie, cell phone or similar).

- e. Any other items of equipment or materials required to demonstrate conformance with the Contract Documents.
- C. Telephone: Outside Plant, Inside Riser Wire:
- 1. General:
    - a. A new cable shall be tested only after all wires within the cable have been terminated at both ends.
    - b. For unshielded cable, "measurements to ground" means an electrical connection to the Telecommunications Ground Bus, building steel, electrical metallic conduit or a water pipe.
    - c. The Contractor shall correct all defects possible.
    - d. If the maximum number of unrepairable defective pairs exceeds 4% of the cable's pair count, the cable shall be deemed unacceptable and shall be replaced. Replace, re-terminate and retest new cable at no additional cost to the Owner.
  - 2. Test procedures:
    - a. TEST #1 – Continuity:
      - (1) Meter set for 20 ohm full scale ohm reading. Each pair shall be shorted at one end and the loop resistance value read at the other.
      - (2) The difference between the largest and the smallest resistance reading from each pair in the cable shall be no more than 10 percent of the largest reading.
    - b. TEST #2 -Balance, Polarity and Conductor Transpositions:
      - (1) Upon passing Test #1, the tester at one end of cable shall ground tip side of each pair in turn. The tester at other end of cable reads resistance to building ground of same conductor.
    - c. REQUIREMENT: Reading for each tip conductor in pair of approximately one-half the loop resistance value from Test #1.
  - 3. Test Report:
    - a. Submit Test Report. Documentation shall include loop resistance regarding any opens, shorts, transpositions found, as well as corrective action taken to correct any found opens, shorts, or transpositions.
- D. Fiber Optic Cabling.
- 1. Perform fiber optic cable testing on all installed fiber optic cabling. Submit test that fiber optic cable testing shall commence. Submit calibration certification for testing equipment to be used.

2. Submit test report no later than five days after the cables are tested.
3. Test and submit Power Meter attenuation assessments test results on each fiber, in each cable, and in both directions under final installation conditions. Submit with the following information:
  - a. Date of test
  - b. Name of test personnel
  - c. Fiber cable type and part number
  - d. Fiber number
  - e. TX wavelength
  - f. TX location
  - g. RX location
  - h. TX model and serial number
  - i. RX model and serial number
  - j. Attenuation in dB
4. Acceptance Tests
  - a. Power Meter Attenuation Test
    - (1) Perform on all fiber cabling segments.
    - (2) Method: Perform the following measured attenuation tests using the method B of ANSI/EIA/TIA-526-14A for multimode strands and ANSI/EIA/TIA-526-7 for single mode strands. Measure the attenuation of the fiber optic network inclusive of all splices and patch points called for on the Drawings.
    - (3) Measure attenuation between all the coupling points (when applicable) using the insertion method.
    - (4) Perform a reference measurement in dBm to determine the injection power level of the stabilized source. Reference cable shall have the same core diameter as strands under test.
    - (5) Connect the optical source directly to the optical power level meter using 2 reference cables and a coupler. Using the other reference cable.
    - (6) Obtain the measured attenuation (in dB) by subtracting the reference level (dBm) from the received level (dBm).
  - b. Periodically during the acceptance tests, check and document the reference level.



- (1) Test each fiber link for overall attenuation from end to end in both directions.
  - (2) Perform the attenuation acceptance test at the 850 nm wavelength for multi-mode and 1310 nm for single-mode.
- c. OTDR Distance and Attenuation Assessments
- (1) Perform on all cabling segments 1000 feet or longer.
  - (2) Perform in accordance with the requirements of:
    - (a) ANSI/EIA/TIA-568-B.1
    - (b) ANSI/EIA/TIA-568-B.3
    - (c) TIA/EIA-455-59-A
  - (3) Test and submit strip charts and/or tracer recordings on all strands in each tube in every cable in both directions. Submit with the following information:
    - (a) Date of test
    - (b) Name of test personnel
    - (c) Test wavelength
    - (d) Pulse duration(s) and scale range(s)
    - (e) Index of refraction
    - (f) Fiber cable type and part number
    - (g) Fiber tube and/or fiber strand number
    - (h) Direction of test
    - (i) Overall distance
    - (j) Attenuation in dB

## **PART 2 – PRODUCTS**

### **2.01 COMMUNICATIONS CABLES AND RELATED**

#### **A. GENERAL**

1. Cabling shall be UL listed for the application and shall comply with EIA TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3 and NFPA 70.
2. Ship cable on reels and/or in boxes bearing manufacture date for UTP in accordance with ICEA S-90-661 and optical fiber cables in accordance with ICEA S-83-596 for all cable used on this project. Cabling manufactured more than 12 months prior to date of installation shall not be used.

3. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
4. At risers and plenums, provide type CMP or OFNP cabling.
5. Refer to Section 27 14 00 -Communications Outside Plant Backbone Cabling for underground cabling installation.

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. All system cabling and terminations be installed in accordance with the manufacturer's instructions and as shown.
- B. All necessary interconnections, services, and adjustments required for a complete and operable system shall be provided. All installation work must be done in accordance with the safety requirements set forth in the general requirements of ANSI C2 and NFPA 70.
- C. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- D. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
- E. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire or cable shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
- F. Correct unacceptable wiring conditions including but not limited to:
  1. Deformed, brittle or cracked insulation.
  2. Torn or worn cable jacket.
  3. Excessively scored cable jackets.

4. Insulation shrunken or stripped further than 1/8" away from the actual point of connection within a connector, or on a punch block.
5. Ungrommated, unbushed, or uninsulated wire or cable entries.
6. Deformation or improper radius of wire or cable.

### **3.02 SPLICING**

- A. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
  1. At designated splices, maintain conductor color code across all splices.
    - a. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures.
    - b. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards.

### **3.03 CABLING INSTALLATION**

- A. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.
- B. Inspect all conduit bends to verify proper radius. Comply with Code for minimum permissible radius and maximum permissible deformation.
- C. Apply a chemically inert lubricant to all wire and cable prior to pulling in conduit. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Use multi-spool rollers where cable is pulled in place around bends. Do not pull reverse bends.
- D. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.

### **3.04 SUPPORTS**

- A. Secure all wire and cable run vertically for continuous distances greater than thirty (30) feet. Secure robust non-coaxial cables with screw-flange nylon cable ties or similar devices appropriate to weight of cable. For all other cables, provide symmetrical conforming nonmetallic bushings or woven cable grips appropriate to weight of cable.
- B. Separation. Conform to the following table with respect to separation from power and radio frequency (RF) sources. Provide at least twice the listed separation at fluorescent light fixtures, ballasts and similar high intensity Electromagnetic Field sources, including but not limited to motors, transformers and copiers.

C. Separation of Telecommunications Cabling and Pathways from 480 V or Lower Power Lines

Condition	Minimum Separation Distance		
	<1kVA	2-5kVA	>5kVA
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways.	5 in	12 in	24 in
Unshielded power lines in proximity to a grounded metal conduit pathway.	2.5 in	6 in	12 in
Power lines enclosed in a grounded metal conduit (or equivalent shielding) In proximity to a grounded metal Conduit pathway.	N/A	3 in	6 in

D. Support: Provide support for all cabling. Conform to the restrictions of the National Electric Code and Section 27 05 29.

**END OF SECTION**

## **SECTION 27 11 19 – COMMUNICATIONS TERMINATION BLOCKS AND PATCHING**

### **PART 1 – GENERAL**

#### **1.01 SCOPE OF WORK**

- A. This Section defines material standards for:
  - 1. Copper Termination Assemblies, including
    - a. Rack and cabinet mounted copper patch panels
    - b. Backboard, rack and cabinet mounted terminal blocks

#### **1.02 RELATED WORK UNDER OTHER SECTIONS**

- A. Section 27 05 00 – Common Work Results for Communications Systems
- B. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- C. Section 27 11 23 – Communications Cable Management
- D. Section 27 15 00 – Communications Horizontal Cabling

#### **1.03 REFERENCES**

- A. ELECTRONIC INDUSTRIES ALLIANCE (EIA)
  - 1. EIA-310-D (1992) Cabinets, Racks, Panels, and Associated Equipment (ANSI/EIA/310-D)

#### **1.04 SUBMITTALS**

- A. Conform with the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications Systems.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Procedures: In accordance Division 1 and Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

#### **1.06 SEQUENCING**

- A. Not Used.

### **PART 2 – PRODUCTS**

## 2.01 COPPER CABLE TERMINATION DEVICES AND RELATED

- A. Data and Voice Horizontal Cabling Patch Panels, Rack Mounted, Category 6A
  - 1. Functions/Features:
    - a. 19" EIA rack mountable.
    - b. At least 48 ports per 3 EIA rack units (3 x 1.75").
    - c. Client standard jacks on steel plate
      - 1) arranged in rows,
      - 2) jacks on front
      - 3) terminations on rear.
    - d. Port identifier label space on front.
    - e. Integral cable management bar at rear and rings at front.
    - f. Patch panels are angled to allow cable routing directly to vertical cable managers.
    - g. Patch panels will use cable termination modules to correctly position the data cable pairs for accurate cable positioning and to reduce the variability in cable terminations.
  - 2. Manufacturer
    - a. Systimax 360 Patchmax GS5 Gigaspeed X10D Patch Panel. (Client Standard).
- B. Voice Feeder Patch Panels (protectors to rack frame)
  - 1. Functions/Features:
    - a. 19" EIA rack mountable.
    - b. At least 48 ports per 3 EIA rack units (3 x 1.75").
    - c. Client standard jacks on steel plate
      - 1) arranged in rows,
      - 2) jacks on front
      - 3) terminations on rear.
    - d. Port identifier label space on front.

- e. Integral cable management bar at rear and rings at front.
  - f. Patch panels are angled to allow cable routing directly to vertical cable managers.
  - g. Patch panels will use cable termination modules to correctly position the data cable pairs for accurate cable positioning and to reduce the variability in cable terminations.
2. Manufacturer
- a. Systemax Power Sum Patch Panel. (Client Standard).
- C. Data Patch Cables
- 1. Provide the following patch cables and assemblies:
    - a. Station Patch Cords – Two Hundred Fifty (250) 7' patch cords (color: blue, category 6A).
    - b. Data Patch Cords – Two Hundred Fifty (250) 10' patch cords (color: blue, category 6A).
  - 2. Manufacturers:
    - a. Systemax GigaSPEED X10D GS8E (for Cat 6A, Client Standard, No Substitution Allowed).
- D. Voice Patch Cables
- 1. Provide the following patch cables and assemblies:
    - a. Voice Patch Cords – Two Hundred Fifty (250) 7' patch cords (color: white, category 6A).
  - 2. Manufacturers:
    - a. Systemax GigaSPEED X10D GS8E (for Cat 6A, Client Standard, No Substitution Allowed).

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- E. Refer to Section 27 10 00 – Structured Cabling, Basic Materials and Methods and Section 27 15 00 – Communications Horizontal Cabling.

## **END OF SECTION**

## **SECTION 27 11 23 – COMMUNICATIONS CABLE MANAGEMENT**

### **PART 1 – GENERAL**

#### **1.01 SCOPE OF WORK**

- A. Section includes provision of cable management for cabling installed under the work of this Project.
- B. Scope includes:
  - 1. Innerduct
    - a. Interior
  - 2. Cable End Spillway
  - 3. Backboard Cable Management
  - 4. Patch Panel Cable Management at racks and cabinets

#### **1.02 RELATED WORK IN OTHER SECTIONS**

- A. Section 27 05 33 – Conduits and Back boxes for Communications Systems
- B. Section 27 05 53 – Identification for Communications Systems
- C. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- D. Section 27 11 19 – Communications Termination Blocks and Patch Panels
- E. Section 27 15 00 – Communications Horizontal Cabling

#### **1.03 REFERENCES**

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM D2239-03 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- B. Underwriters Laboratories (UL)
  - 1. UL 910 Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical-Fiber Cables used in Spaces Transporting Environmental Air (Nov. 1998)

#### **1.04 SUBMITTALS**

- A. Conform with the requirements of Division 1 and Section 27 05 00 -Common Work Results for Communications Systems.

#### **1.05 DELIVERY, STORAGE AND HANDLING**



- A. Procedures: In accordance with Division 1 and Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

## **1.06 SEQUENCING**

- A. Not Used.

## **PART 2 – PRODUCTS**

### **2.01 CONDUIT CABLE MANAGEMENT**

- A. Conduit End Waterfall Spillway
  - 1. Features/Functions
    - a. Spillway fastens to end of EMT conduit, provides radius sweep, open on top, solid from below
    - b. Maintains proper bend radii for fiber/cable
    - c. Provides tie points for fire pillow retention
    - d. Supports up to 100 lbs. of hanging fiber/cable
    - e. Clamp for securing to EMT
    - f. Self-fastening tie down system for supporting cabling
  - 2. Construction:
    - a. Fire Retardant ABS
  - 3. Manufacturers:
    - a. Bejed BJ-2049 Spillway.

### **2.02 BACKBOARD CABLE MANAGEMENT**

- A. Fiber Management Ring, Preformed Loop
  - 1. Construction:
    - a. 24 inch diameter steel ring stores fiber slack using Velco fasteners at regular intervals around ring.
    - b. Screw fastens to backboard at BDF or IDF.
  - 2. Manufacturer
    - a. Leviton 48900-OFR
    - b. or equal (no known equal)
- B. Wire Management, Rack Mounted, Snap Cover

1. Construction:
  - a. EIA 19 or 23" Rack Mount, as required.
  - b. Continuous flexible system of fingers and slots along top and panel, deburred to avoid snagging patch cord jacket.
  - c. Snap Cover.
  
2. Manufacturer
  - a. Systimax HCM2U (Client Standard).
  
- C. Wire Management Rings, Wall/Ceiling Mounted:
  1. References/Functions Features:
    - a. Bridle Ring Type, Threaded Lag Screw
    - b. Closed Ring, U shaped assembly with two screw holes at ends,
    - c. Open, Re-enterable Split Ring permitting cables to be inserted midspan, two screw holes at ends
  
  2. Provide as required to support indicated cable bundle and location.
  3. Provide type Bridle Ring at wood frame construction for cable hung from underside of ceiling, unless otherwise noted.
  4. Manufacturers:
    - a. Bridle Ring:
      - (1) B-Line Fasteners, BR Series
      - (2) Senior Industries
      - (3) T&B
      - (4) or equal.
  
    - b. Closed Ring
      - (1) Chatworth Products Wall Mount Closed D Ring.
      - (2) Senior Industries
      - (3) or equal.
  
    - c. Open Ring
      - (1) Chatworth Products Wall Mount Open Ring.
      - (2) AllenTel
      - (3) Systimax, Inc.
      - (4) Siemon
      - (5) or equal.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. Refer to Section 27 13 00 Communications Indoor Backbone Cabling for requirements for cable routing within IDF's, and BDF's.

### **3.02 INNERDUCT INSTALLATION**

- A. Schedule of Application
  - 1. Underground
    - a. At 4" ducts and inside maintenance holes and vaults, place fiber cabling and 50 pair and smaller copper telephone cabling inside inner duct.
    - b. At tray conditions and at backboards, cable runway and tray conditions at communications closets, protect fiber cabling with inner duct.
  - 2. At plenum tray conditions, provide inner duct plenum rated.
  - 3. At 4" and larger interior conduits, provide inner duct. Provide plenum rated at plenum ceiling conditions.

### **3.03 CONDUIT END WATERFALL**

- A. Fasten securely to conduit end wherever cabling will exit conduit 18" or more above the cable tray to prevent damage due to cabling due to weight of cable bearing on a conduit end.
- B. Secure cabling with integral cable restraint system.

## **END OF SECTION**

**SECTION 27 15 00 – COMMUNICATIONS HORIZONTAL CABLING**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. The OWNER has standardized to SYSTIMAX 360 Solution's GigaSPEED XD10 creating an efficient, reliable, integrated and economical Category 6A or better twisted pair and fiber wiring system which supports Local Area Network applications to minimum 500 MHz bandwidth, high speed distribution for Wireless Area Network (WAN) services, voice systems, services for facsimiles and modems, and video systems as specified herein. The intention of this design is to support telecommunication system technology for the next 20 years.
- B. Provisions of this Section apply to Communications Work, including the following Sections:
  - 1. Section 27 05 29 – Hangers and Supports for Communications Systems
  - 2. Section 27 05 33 – Conduits and Backboxes for Communications Systems
  - 3. Section 27 05 53 – Identification for Communications Systems
  - 4. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
  - 5. Section 27 11 19 – Communications Termination Blocks and Patch Panels
  - 6. Section 27 11 23 – Communications Cable Management

**1.03 DEFINITIONS**

- A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
- B. BICSI: Building Industry Consulting Service International.
- C. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel.
- D. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.
- E. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

- F. EMI: Electromagnetic interference.
- G. IDC: Insulation displacement connector.
- H. LAN: Local area network.
- I. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- J. RCDD: Registered Communications Distribution Designer.
- K. UTP: Unshielded twisted pair.

#### **1.04 HORIZONTAL CABLING DESCRIPTION**

- A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.
  - 1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
  - 2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
  - 3. Bridged taps and splices shall not be installed in the horizontal cabling.
  - 4. Splitters shall not be installed as part of the optical fiber cabling.
- B. Both voice and data outlets are to be enhanced Category 6A, designed to operate at a bandwidth of 500 MHz and gigabit or greater data speeds per the TIA/EIA 568-A (including all updates and addenda), and shall be terminated to the Category 6 standard on both ends of the cable (SYSTIMAX 2091B, typical). Data cables will be terminated on patch panels; voice on patch panels unless otherwise directed by OWNER's Representative. The maximum allowable horizontal cable length is 295 feet (90 m). This maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) to the workstation equipment. The maximum allowable length.

#### **1.05 PERFORMANCE REQUIREMENTS**

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

#### **1.06 SUBMITTALS**

- A. Product Data: For each type of product indicated.

- B. Shop Drawings:
  - 1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
  - 2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
  - 3. Cabling administration drawings and printouts.
  - 4. Wiring diagrams to show typical wiring schematics, including the following:
    - a. Cross-connects.
    - b. Patch panels.
    - c. Patch cords.
  - 5. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
  - 6. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:
    - a. Vertical and horizontal offsets and transitions.
    - b. Clearances for access above and to side of cable trays.
    - c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
    - d. Load calculations to loads as not exceeding manufacturer's rating for tray and its support elements.
- C. Samples: For workstation outlets, jacks, jack assemblies, in specified finish, one for each size and outlet configuration.
- D. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
- E. Source quality-control reports.
- F. Field quality-control reports.
- G. Maintenance Data: For splices and connectors to include in maintenance manuals.

#### **1.07 QUALITY ASSURANCE**

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings, Cabling Administration Drawings, and field testing program development by an RCDD.
  2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
  3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
  4. Cabling installer shall have a minimum five (5) years experience in contracting and performing the types of work specified herein.
  5. Cabling installer shall be certified by SYSTIMAX Solutions as an Authorized Installer and a Value Added Reseller (VAR) with a minimum of \$3,000,000 per year revenue for the prior three (3) years, and shall maintain such certification throughout the period of the Contract. Throughout the term of the Contract, Cabling installer shall keep current in the Systemax Engineering Course requirements;
    - a. Keep current in the Systemax Installation and Maintenance Course requirements;
    - b. Maintain a designer on staff who is a certified Building Industry Consulting Services International (BICSI) consultant and maintains a Registered Communications Distribution Designer (RCDD) status;
    - c. Maintain a sufficient number of sales, design and installation personnel to perform the Work in a timely manner;
    - d. Use installers that receive regular ongoing update training supplied by the territory Systemax Manager; and
    - e. Maintain a "Good" rating by Dun and Bradstreet.
- B. Testing Agency Qualifications: An NRTL.
1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
  2. Smoke-Developed Index: 50 or less.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- E. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- F. Grounding: Comply with ANSI-J-STD-607-A.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Test cables upon receipt at Project site.
  - 1. Test each pair of UTP cable for open and short circuits.

**1.09 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

**1.10 COORDINATION**

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.
- B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

**1.11 EXTRA MATERIALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Patch-Panel Units: One of each type.
  - 2. Connecting Blocks: Twenty of each type.
  - 3. Device Plates: 6 of each type.
  - 4. Multiuser Telecommunications Outlet Assemblies: Five of each type.

**PART 2 – PRODUCTS**

**2.01 PATHWAYS**

- A. General Requirements: Comply with TIA/EIA-569-A.
- B. Cable Support: NRTL labeled for support of Category 6A cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
  - 1. Support brackets with cable tie slots for fastening cable ties to brackets.
  - 2. Lacing bars, spools, J-hooks, and D-rings.



3. Straps and other devices.
- C. Conduit and Boxes: Comply with requirements in Division 27 Section "Conduits and Boxes for Telecommunications." Flexible metal conduit shall not be used.
  1. Outlet boxes shall be no smaller than 4 11/16 inches type, deep.

## **2.02 UTP CABLE**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. SYSTIMAX 360 Solutions; a CommScope, Inc. brand.
    - a. Blue for data transmission connections
    - b. White for voice transmission connections
- B. Description: 100-ohm, 4-pair UTP, CAT-6A with a blue jacket.
  1. Comply with ICEA S-90-661 for mechanical properties.
  2. Comply with TIA/EIA-568-B.1 for performance specifications.
  3. Comply with TIA/EIA-568-B.2, Category 6.
  4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
    - a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

## **2.03 UTP CABLE HARDWARE**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. SYSTIMAX 360 Solutions; a CommScope, Inc. brand.
- B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- C. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
  1. Number of Terminals per Field: One for each conductor in assigned cables.
- D. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.

1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to suit specified expansion criteria.
- E. Jacks and Jack Assemblies: Modular, color-coded, four position modular receptacle units with Modular, color-coded, M14L type faceplates (coordinate color with Architect).
- F. Data Patch Cords: Factory-made, four-pair cables in 10 feet (3048mm) lengths; terminated with eight-position modular plug at each end.
  1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6A performance. Patch cords shall have latch guards to protect against snagging.
  2. Provide a minimum of 250 patch cords for frame patching, blue in color.
- G. Data Station Cords: Factory-made, four-pair cables in 7 feet (2133mm) lengths; terminated with eight-position modular plug at each end.
  1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6A performance. Patch cords shall have latch guards to protect against snagging.
  2. Provide a minimum of 250 patch cords for station patching to workstations, blue in color.
- H. Voice Patch Cords: Factory-made, four-pair cables in 7 feet (2133mm) lengths; terminated with eight-position modular plug at each end.
  1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6A performance. Patch cords shall have latch guards to protect against snagging.
  2. Provide a minimum of 250 patch cords for frame patching, white in color.

#### **2.04 TELECOMMUNICATIONS OUTLET/CONNECTORS**

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.
- B. Workstation Outlets: Four port-connector assemblies mounted in single faceplate and/or as shown on the contract documents and details.
  1. Metal Faceplate: Stainless steel, complying with requirements in Division 27 Section for wall phone applications, similar to Systemax M10LW4.
  2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.

- a. Flush mounting jacks, positioning the cord at a 0-degree angle, flush face.
- 3. Legend: Factory labeled by silk-screening or engraving for stainless steel faceplates.
- C. Workstation Outlet type:
  - 1. In plastic face plate, terminate and install color coded jacks/outlets in accordance with these specifications and details provided within the construction documents.
  - 2. Voice outlets shall be MGS600, white in color
  - 3. Data outlets shall be MGS600, blue in color

## **2.05 GROUNDING**

- A. Comply with requirements in Division 27 05 26 Section "Grounding and Bonding for Telecommunications Systems" for grounding conductors and connectors.
- B. Comply with ANSI-J-STD-607-A.

## **2.06 IDENTIFICATION PRODUCTS**

- A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Division 27 05 53 Section "Identification for Telecommunications Systems."

## **2.07 SOURCE QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test UTP cables on reels according to TIA/EIA-568-B.1.
- C. Factory test UTP cables according to TIA/EIA-568-B.2.
- D. Cable will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

## **PART 3 – EXECUTION**

### **3.01 ENTRANCE FACILITIES**

- A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

### 3.02 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.
  - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
  - 2. Comply with requirements for raceways and boxes specified in Division 27 Section "Conduits and Boxes for Telecommunications Systems."
- B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

### 3.03 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
  - 1. Comply with TIA/EIA-568-B.1.
  - 2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
  - 3. Install 110-style IDC termination hardware unless otherwise indicated.
- C. Terminate conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
- D. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
- E. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
- F. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
- G. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
- H. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.

- I. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
- J. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- K. UTP Cable Installation:
  - 1. Comply with TIA/EIA-568-B.2.
  - 2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.
- L. Open-Cable Installation:
  - 1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
  - 2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceilings by cable supports not more than 60 inches (1524 mm) apart.
  - 3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
- M. Installation of Cable Routed Exposed under Raised Floors:
  - 1. Install plenum-rated cable only.
  - 2. Install cabling after the flooring system has been installed in raised floor areas.
  - 3. Coil cable 6 feet (1800 mm) long not less than 12 inches (300 mm) in diameter below each feed point.
- N. Group connecting hardware for cables into separate logical fields.
- O. Separation from EMI Sources:
  - 1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
  - 2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
    - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).

- c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).
- 3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
  - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
  - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
  - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).
- 4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
  - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
  - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
  - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).
- 5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
- 6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

**3.04 FIRESTOPPING**

- A. Comply with requirements in Division 07 Section "Penetration Firestopping."
- B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

**3.05 IDENTIFICATION**

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 27 Section "Identification for Telecommunications Systems."
  - 1. Administration Class: 1.
  - 2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.

- B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as-built conditions.
- C. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.
- D. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2 level of administration, including optional identification requirements of this standard.
- E. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Owner.
- F. Cable and Wire Identification:
  - 1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
  - 2. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
- G. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
  - 1. Cables use flexible vinyl or polyester that flex as cables are bent.

### **3.06 FIELD QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
  - 1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.

2. Visually confirm Category 6A, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
  - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568- B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cord and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
5. UTP Performance Tests:
  - a. Test each outlet. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
    - (1) Wire map.
    - (2) Length (physical vs. electrical, and length requirements).
    - (3) Insertion loss.
    - (4) Near-end crosstalk (NEXT) loss.
    - (5) Power sum near-end crosstalk (PSNEXT) loss.
    - (6) Equal-level far-end crosstalk (ELFEXT).
    - (7) Power sum equal-level far-end crosstalk (PSELFEXT).
    - (8) Return loss.
    - (9) Propagation delay which matches cabling submittal.
    - (10) Delay skew.
6. Final Verification Tests: Perform verification tests for UTP after the complete communications cabling and workstation outlet/connectors are installed.
  - a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.



- b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.
- D. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

### **3.07 DEMONSTRATION**

- A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

### **3.08 WARRANTY**

- A. Manufacturer and installer shall warrant the cabling system as follows in addition to above requirements:
  - 1. Each channel is comprised of the manufacturers augmented Category 6A, Class E<sub>A</sub> passive products, end-to-end, and is capable of delivering 10Gbs to the workstation in accordance with applicable standards for CAT-6A and 10g transmission.
  - 2. The contractor/installer shall provide the SYSTIMAX SCS 20-year Extended Product Warranty and Applications Assurance to registered SYSTIMAX installations. This installation shall be registered with SYSTIMAX CommScope to extend its SYSTIMAX 20-year Application Assurance coverage to the registered installation and shall include all applications available, not withstanding any applications introduced in the future by recognized Standards or user forums that utilize the relevant channel specifications in ANSI/TIA/EIA-568-B, CENELEC EN 50173-1:2002, or ISO/IEC IS11801:2002 including but not limited to:
    - a. SYSTIMAX Solutions warrants that each SYSTIMAX channel comprised exclusively of SYSTIMAX GigaSPEED X10D passive products, end-to-end, is capable of delivering 10Gb/s to the workstation in accordance with application standards.

**END OF SECTION**

## **SECTION 31 23 19 - DEWATERING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications and procedure for the dewatering of excavations and disposal of water.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 31 23 33 – Trenching and Backfilling.

#### **1.03 SUBMITTALS**

- A. Prior to installation of the dewatering system, submit shop drawings and design data indicating the following:
  - 1. The proposed type of dewatering system.
  - 2. Arrangement, location and depths of system components.
  - 3. Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.
  - 4. Methods of disposal of pumped water.
  - 5. Necessary permits for water disposal.

### **PART 2 PRODUCTS**

#### **2.01 EQUIPMENT**

- A. Furnish all materials, tools, equipment, facilities, and services as required for providing the necessary dewatering work and facilities.
- B. Provide backup equipment as necessary for the replacement and for unanticipated emergencies.

### **PART 3 EXECUTION**

#### **3.01 DEWATERING**

- A. Keep excavation reasonably free from water during construction.
- B. Disposal of water shall not damage property or create a public nuisance.
- C. Have on hand pump equipment and machinery in good working condition for emergencies and workmen available for its operation.
- D. Dewatering systems shall operate continuously until excavations are backfilled.
- E. Groundwater shall be controlled to prevent softening of the bottom of excavations, or formation of "quick" conditions.
- F. Dewatering systems shall not remove natural soils.
- G. Control surface runoff to prevent entry or collection of water in excavations.
- H. Release of groundwater shall be controlled to prevent disturbance of the natural foundation soils or compact fill.
- I. There shall be no discharge of turbid water on site or from the site to offsite areas.
- J. Discharge or disposal of water shall be controlled to prevent erosion

**END OF SECTION**

## **SECTION 31 23 33 – TRENCHING AND BACKFILLING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications for excavating, backfilling, and compacting for the installation of pipe and pipeline appurtenances.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 31 23 19 – Dewatering.
- C. Section 32 11 23 – Aggregate Base

#### **1.03 REFERENCE STANDARDS**

- A. City of Petaluma Standard Specifications – Latest Edition
- B. City of Petaluma Standard Plans – Latest Edition
- C. PG&E Standard Specifications – Latest Edition
- D. AT&T Standard Specifications – Latest Edition
- E. California Plumbing Code – Latest Edition
- F. Caltrans Standard Specifications and Drawings – Latest Edition

### **PART 2 PRODUCTS**

#### **2.01 BACKFILL MATERIAL**

- A. Trench Backfill
  - 1. Storm Drain: Trench backfill shall consist of Class 2 Aggregate Base, unless otherwise noted.
  - 2. Fire Suppression Water Supply Pipeline:
    - a. Cover and Bedding: Select sand that meets the criteria for cover and bedding as described in the City of Petaluma Standards.
    - b. Backfill: Native soil that meets the criteria for fill as described in the City of Petaluma Standards.

#### **2.02 PIPING MATERIAL**

- A. All piping material shall conform to respective utility agency and the California Plumbing Code.

### **2.03 BURIED WARNING AND IDENTIFICATION TAPE**

- A. Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines and as specified in the City of Petaluma Standards. Provide tape on rolls, 6-inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, 'CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.
  - 1. Warning Tape Color Codes.
    - a. Red: Electric.
    - b. Yellow: Gas, Oil; Dangerous Materials.
    - c. Orange: Telephone and Other Communications.
    - d. Blue: Water Systems.
    - e. Green: Sewer Systems.
    - f. White: Steam Systems.
    - g. Grey: Compressed Air.
  - 2. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.
  - 3. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3-feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

### **2.04 DETECTION WIRE FOR NON-METALLIC PIPING**

- A. Detection wire shall be insulated single strand, solid copper wire with a minimum of 12 AWG.

## **PART 3 EXECUTION**

### **3.01 EXCAVATION**

#### **A. General**

1. Keep trench dry throughout construction operations
2. Trench excavation shall follow the alignment of the pipe or utility centerline
3. No more than 100 LF of trench shall be open at one time

#### **B. Shoring and Bracing**

1. Contractor is responsible for any damage or injury resulting from his construction operations. Contractor shall perform, at his own expense, all necessary repair work or reconstruction.
2. Contractor will be responsible for all shoring with bracing design and installation.

#### **C. Excavation Required Beyond Trench Limits**

1. Excavation (bell holes) where necessary in the sides and bottom of the trench at pipe joint locations shall be large enough to make joints and permit inspection.
2. Excavation to a greater depth than shown on the plans may be ordered by the City Engineer if the native material at the bottom of the trench will not provide proper support for the pipe or if the excavation is in rock.
3. Remove all adjacent, saturated material where pipeline leaks occur.

### **3.02 UTILITIES**

#### **A. Location**

1. Approximate known locations of underground utilities and structures are indicated on the plans. Contractor shall determine exact location of underground utilities and structures prior to construction.
2. Adjustments of pipe alignment and elevation will be authorized by the Owner where exploratory work indicates the need.

#### **B. Excavation Around Utilities**

1. Excavation and other work under or adjacent to utilities shall not interfere with their safe operations and use.
2. Probe carefully to determine the exact location of utility and hand excavate where necessary to avoid damage.

3. In the event of damage incurred during construction near such structures or property, Contractor shall immediately notify the Owner and other appropriate utility or public safety authorities and shall arrange for immediate repairs at Contractor's expense.

C. Tunneling Under Utilities

1. Tunneling may be allowed for short distances with the approval from the City Engineer.

**3.03 BLASTING**

- A. Blasting will not be permitted.

**3.04 BACKFILL OF TRENCHES**

- A. Prior to backfilling, the trench shall be cleared of all wood and debris.
- B. Backfill pipeline trenches to the level of the original ground surface or the underside of the pavement base course.
- C. Backfill material shall not be dropped directly on the pipe.
- D. Carefully remove timbering, sheeting, shoring and sheet piling, according to the instructions of the shoring system designer or the manufacturer, using methods that will minimize caving. If caving is occurring, the shoring system will be required to remain in place up to one to six inches above the top of the pipe.
- E. Jetting of trench backfill is not permitted.
- F. If trench has been excavated below the specified depth, that portion of the trench shall be backfilled with Class 2 or select material and compacted before pipe installation, at the Contractor's expense.
- G. If pipe or conduit has less than 18 inches of final cover, trench shall be backfilled with Control Density Fill (CDF) to a depth specified by the Engineer.

**END OF SECTION**

## **SECTION 32 11 23 – AGGREGATE BASE**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications for furnishing, spreading, and compacting aggregate base course for pavements as indicated.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 03 30 01 – Cast-in-Place Concrete for Exterior Work.
- C. Section 32 16 13 – Concrete Curbs, Gutters and Walks.

#### **1.03 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
  - 2. ASTM D3017 - Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
- B. State of California, Department of Transportation (Caltrans), Standard Specifications
- C. State of California, Department of Transportation (Caltrans), Standard Test Methods
  - 1. Calif. Test 201 - Method of Soil and Aggregate Sample Preparation Aggregates
  - 2. Calif. Test 202 - Method of Tests for Sieve Analysis of Fine and Coarse Aggregates
  - 3. Calif. Test 205 - Method of Determining Percentage of Crushed Particles
  - 4. Calif. Test 216 - Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates
  - 5. Calif. Test 217 - Method of Test for Sand Equivalent
  - 6. Calif. Test 229 - Method of Test for Durability Index
  - 7. Calif. Test 301 - Method of Test for Resistance "R" Value of Treated and Untreated Bases, Subbases and Basement Soils by the Stabilometer

### **PART 2 PRODUCTS**



**2.01 MATERIALS**

A. Aggregate Base Material

1. Class 2 aggregate base shall be free of vegetable matter and other deleterious substances. Coarse aggregate, material contained on the No. 4 sieve, shall consist of material of which 25 percent by weight shall be crushed particles as determined by California Test Method No. 205. Class 2 aggregate base shall conform to one of the following gradings, determined in accordance with California Test Method No. 202:

Percentage Passing Sieves for 3/4 Inch Maximum	
Sieve Size	Percentage Passing
2 inch	---
1-1/2 inch	---
1 inch	100
3/4 inch	90-100
No. 4	35-60
No. 30	10-30
No. 200	2-9

2. Class 2 aggregate base shall conform to the following additional requirements:

Tests	Test Method No. Calif.	Requirements
Resistance (R-Value)	301	78 minimum
Sand Equivalent	217	22 minimum

Tests	Test Method No. Calif.	Requirements
Durability Index	229	35 minimum

B. Source Quality Control

1. Submit certificate of compliance for approval prior to installation of material.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Call for an inspection by the Engineer and obtain written acceptance of the prepared subgrade or subbase before proceeding with the placement of aggregate base course.
- B. The subgrade or subbase to receive aggregate base course, immediately prior to spreading, shall conform to the compaction and elevation tolerances indicated for the material involved and shall be free of standing water and loose or extraneous material.

**3.02 INSTALLATION STANDARDS**

- A. Aggregate base course shall be applied over the prepared subgrade or subbase and compacted in accordance with Section 26 of the Caltrans Standard Specifications.
- B. Aggregate base course shall be minimum uniform thickness after compaction of dimensions indicated. Where not indicated, compacted thickness shall be six inches for driveways/sidewalks and eight inches for roadways.
- C. All compaction expressed in percentages in this section refers to the maximum dry density as determined by California Test Method No. 216.

### **3.03 SPREADING OF MATERIAL**

- A. Aggregate for base course shall be delivered as uniform mixture of fine and coarse aggregate and shall be spread in layers without segregation.
- B. Aggregate base course material shall be free from pockets of large and fine material. Segregated materials shall be remixed until uniform.
- C. Aggregate base material shall be moisture-conditioned to near optimum moisture content in accordance with the applicable requirements of Section 17 of the Caltrans Standard Specifications.
- D. Aggregate base course six inches and less in thickness may be spread and compacted in one layer. For thicknesses greater than six inches, the base course aggregate shall be spread and compacted in two or more layers of uniform thickness not greater than six inches each.

### **3.04 COMPACTING**

- A. Relative compaction of each layer of compacted aggregate base material shall be not less than 95 percent as determined by California Test Method No. 216.
- B. Thickness of finished base course shall not vary more than 3/4 inch from the indicated thickness at any point. Base which does not conform to this requirement shall be reshaped or reworked, watered, and recompact to achieve compliance with specified requirements.
- C. The surface of the finished aggregate base course at any point shall not vary more than 3/4 inch above or below the indicated grade.

### **3.05 FIELD QUALITY CONTROL**

- A. Perform field tests in accordance with ASTM D2922 to determine compliance with specified requirements for density and compaction of aggregate base material, and with ASTM D3017 to determine moisture-content compliance of the installed base course.

**END OF SECTION**

## **SECTION 32 16 13 – CONCRETE SIDEWALKS AND PADS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications for providing Portland Cement concrete for sidewalks and utility pads, as indicated.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 03 30 01 – Cast-in-Place Concrete for Exterior Work
- C. Section 32 11 23 – Aggregate Base

#### **1.03 REFERENCE STANDARDS**

- A. American Concrete Institute (ACI):
  - 1. ACI 301 – Standard Specifications for Structural Concrete
  - 2. ACI 318/381R – Building Code Requirements for Structural Concrete and Commentary
- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM A53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
  - 2. ASTM A615/A615M – Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
  - 3. ASTM A663/A663M – Specification for Steel Bars, Carbon, Merchant Quality, Mechanical Properties.
  - 4. ASTM 260 – Specification for Air Entraining Admixtures for Concrete
  - 5. ASTM 309 – Specification for Liquid Membrane-Forming Compounds for Curing Concrete
  - 6. ASTM C881 – Specification for Epoxy-Resin-Base Bonding Systems for Concrete
- C. City of Petaluma Standards and Specifications, Latest Edition

#### **1.04 SUBMITTALS**

- A. Product Data

1. Respective manufacturer's product data for manufactured products.

## **1.05 QUALITY ASSURANCE**

### **A. Tolerances**

1. Construct concrete surfaces within 1/4 inch of the indicated elevation, and deviating not more than 1/8 inch from a 10 foot straightedge placed anywhere on the surface.
2. Slab tolerances shall be as specified in ACI 301.

### **B. Finishes**

1. Slab finishes shall be as specified herein accordance with the requirements of ACI 301.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

#### **A. Provide Class of Concrete indicated on the Contract Drawings or Construction Drawings.**

1. Provide air-entrainment of three percent ( $\pm$  one percent) with admixture conforming to ASTM C260.
2. Nominal size of large aggregate shall be one inch.
3. Minimum total cement content shall be 520 pounds per cubic yard of concrete.
4. Minimum strength of concrete shall be 3000 psi.

#### **B. Tie Bars**

1. ASTM A615, Grade 60, of type and size indicated.

#### **C. Dowels**

1. Plain round bars meeting requirements of ASTM A615/A615M, Grade 60, of ASTM A663/A663M, Grade 80, epoxy-coated bars, furnished with approved snugfitting ASTM A53 galvanized pipe sleeve. Provide sleeve with one end closed.

#### **D. Weep Holes**

1. ASTM A53 galvanized pipe of size indicated.

#### **E. Concrete Curing Compound**

1. ASTM C309, Type 1.

F. Epoxy Adhesive

1. ASTM C881, Type V for load bearing concrete, Grade and Class as determined by project conditions and requirements.

**PART 3 EXECUTION**

**3.01 PREPARATION OF SUBGRADE**

- A. Excavate for and prepare the subgrade as specified true to the indicated grade and cross section.
- B. Test completed subgrade for correct grade and cross section by means of template supported on side forms.
- C. Dampen subgrade and forms just before placing concrete.

**3.02 TYPES OF CONSTRUCTION**

- A. Provide cast-in-place concrete construction, plain or reinforced as indicated. Sidewalks and utility pads shall be formed accurately to indicated section profile with template screed.

**3.03 JOINTS**

A. Expansion Joints

1. Construct 1/2 inch thick expansion joints in the following locations
  - a. At corners in sidewalks, following the projections of the building lines from the corner of the building to the curb.
  - b. Between sidewalks and any permanent structure.
  - c. Between sidewalk and curb.
2. Construct 1/4 inch thick expansion joints in the following locations:
  - a. Through sidewalks at intervals not greater than 15 feet.
  - b. In sidewalks, encircling fixtures more than 12 inches in diameter.
3. Construct expansion joints as specified in UCS, except that load transfer devices will not be required unless indicated. Shape performed filler to cross section of curbs and combination curb and gutter.

B. Contraction Joints

1. In sidewalks, construct contraction joints in uniform intervals not greater than six feet, by means of a suitable tool which will form a groove 1/2 inch deep and 1/4 inch wide, with the edges rounded to a 1/4 inch radius.

C. Tooling

1. Finish joints with an edging tool having 1/4 inch radius, leaving joints free of mortar and concrete. In preformed type joints, leave joint filler material exposed for full length of joint with clean and true edges.

D. Joint Sealing

1. Seal to within 1/8 inch of pavement surface all joints in curbs and gutters, including gutter surfaces of combination curb and gutter sections, all joints between curbs and vehicular pavement, all joints between gutters and vehicular pavement, and all other expansion joints. Do not seal other joints unless so indicated.
2. Do not seal joints until concrete curing is complete. Prior to installation of the joint sealing compound, clean the joints of dirt and other foreign material. Joints may be cleaned with compressed air jets provided that the air in such jets is free of oil or water. Do not fill joints when there is any free water in or adjacent to joints. Joint walls and all surfaces to which the sealing material is to adhere shall be surface dry for at least three hours prior to sealing.
3. Apply with approved pressurized equipment. Perform sealing joints to make them impervious to water and to prevent the sealing compound from spreading over the surface of the pavement.

**3.04 FORM REMOVAL**

- A. Remove front curb forms not less than two or more than six hours after placing concrete, but in no case while the concrete is still plastic enough to slump.
- B. Remove other forms not less than 12 hours after finishing is completed.

**3.05 FINISHING**

A. Sidewalk and Utility Pads

1. After the concrete has been placed, consolidated, struck off, leveled, grooved and edged as specified herein, and in UCS, do not work the concrete further until ready for floating.
2. Provide "floated finish" or light "broom finish" as indicated in accordance with the requirements of ACI 301.

3. For pedestrian and wheelchair ramps, and all other surfaces where the Contract Drawings require a non-slip finish, provide a “non-slip finish” in combination with a “floated finish” or “broom finish” in accordance with the requirements of ACI 301.
  4. Broom finish shall be applied perpendicular to the direction of traffic flow.
- B. Joints and Edges
1. As soon as the condition of the work permits, perform joint work, edging and marking. Finish all edges with a radius of 1/4 inch.

### **3.06 CURING AND PROTECTION**

- A. Comply with the applicable requirements for curing concrete with liquid membrane-forming curing compound. Do not permit traffic on new concrete pavement until the concrete has cured a minimum period of ten days.
- B. Provide damp curing only for concrete slab surfaces indicated to be treated with concrete hardener and dust proofer.

### **3.07 FIELD QUALITY CONTROL**

- A. The engineer shall perform inspections and tests. The Contractor shall provide such samples and services to facilitate testing.

**END OF SECTION**

## **SECTION 33 11 16 – SITE WATER DISTRIBUTION**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications for providing water service for building fire suppression supply and modification to existing water mains and services as indicated. The extent of water service is indicated on the Contract Drawings and includes furnishing, installing, testing, and disinfecting permanent water supply piping and services as indicated.
- B. Provide services as indicated.
- C. The jurisdictional Water Utility District (District) provides water service to the point of connection for building fire suppression facilities. The Contractor shall be responsible for making all such arrangements for work on the District's and the Owner's facilities.
- D. All work on the Owner's and the District's facilities shall be in accordance with the District's adopted protocol and standards.
- E. Domestic and Fire service facilities and their appurtenances are not to be sized and/or installed until that time the domestic and fire system requirements have been confirmed by the building designers and reviewed and approved by the jurisdictional Water Utility District.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 31 23 00 – Trenching and Backfilling for Utilities

#### **1.03 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM).
  - 1. ASTM A36/A36M - Specifications for Carbon Structural Steel
  - 2. ASTM A126 - Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
  - 3. ASTM A123 - Specifications for Zinc Coated (Hot Dip Galvanized) Coatings on Iron and Steel Products
  - 4. ASTM A197 - Specifications for Cupola Malleable Iron
  - 5. ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
  - 6. ASTM C33 - Specifications for Concrete Aggregates



7. ASTM D1784 - Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
  8. ASTM D1785 - Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Schedules 40, 80, and 120
  9. ASTM D2564 - Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping System
  10. ASTM D3139 - Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
  11. ASTM F439 - Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- B. American Water Works Association (AWWA).
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
  2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
  3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, three inches through 48 inches (75mm Through 1200mm), for Water and Other Liquids
  4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
  5. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids
  6. AWWA C503 - Wet-Barrel Fire Hydrants
  7. AWWA C651 - Disinfecting Water Mains
  8. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, four inches-12 inches
  9. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe, 14 inches-48 inches
- C. Manufacturer's Standardization Society of the Valve and Fittings Industry, Inc. (MSS).
1. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves
- D. Water Utility District Standards.
1. The jurisdictional water utility district's standard drawings and specifications.
    - a. City of Petaluma.

#### **1.04 SUBMITTALS**

- A. Shop Drawings, Product Data, and Samples.

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- B. Manufacturer's product data for manufactured materials and equipment, including all valves and fittings.
- C. Shop drawings showing piping layout and pipe, valves, and locations of tie-ins, buttresses, and thrust blocks.

**1.05 SITE CONDITIONS**

- A. Excavations in which products will be buried shall be dry.
- B. Coordinate the installation of water supply system with the jurisdictional water utility owner.

## **PART 2 PRODUCTS**

### **2.01 BURIED PIPE AND FITTINGS**

- A. Requirements: Provide the types, sizes, and configurations of pipe, fittings, and miscellaneous materials and installation accessories as indicated.
- B. PVC Pipe and Fittings, Three Inches and Smaller
  - 1. Pipe: Polyvinyl chloride (PVC), ASTM D1785, Schedule 80, Type 1, Grade 1.
  - 2. Fittings: ASTM D1784, socket weld, same material and schedule as pipe, or meeting requirements of ASTM F439, as applicable.
  - 3. Joints: Socket welded with PVC solvent cement conforming to ASTM D564.
- C. PVC Pipe and Fittings, Four Inches and Larger
  - 1. Pipe: AWWA C900, SDR 18, Class 235 (AWWA C905, Class 235 for 14" and Larger) polyvinyl chloride (PVC) water pipe with bell and spigot ends and flexible ring joints.
  - 2. Fittings: ASTM D1784, Type 1, Grade 1, polyvinyl chloride (PVC) fittings, Class 305, or meeting requirements or ASTM F439, as applicable.
  - 3. Joints: ASTM D3139, gasketed bell joints with ASTM F477 gaskets.
- D. Ductile Iron Pipe (DIP)
  - 1. Piping: AWWA C151, thickness Class 50.
  - 2. Fittings: AWWA C110.
  - 3. Joints: Field Lok gaskets as manufactured by US Pipe, or equal, with copper jumper to provide electrical continuity. Mechanical, where indicated, in accordance with AWWA C111, with copper jumper to provide electrical continuity.
  - 4. Polyethylene encasement for protection of pipes, valves, and fittings shall be furnished and installed in accordance with AWWA C105.
  - 5. Provide inside pipe and fittings with 1/16 inch thick cement-mortar lining and an asphaltic seal coat in accordance with AWWA C104.

## **2.02 VALVES**

- A. Gate Valves: 150 pound bronze, non-rising stem, wedge disc, threaded connection, conforming with MSS SP-80. (AWWA C509 and AWWA C550).
- B. Pressure Reducing Valves: All bronze construction, spring-loaded, single-seated, suitable for tight shutoff under dead-end conditions. Provide with renewable composition seat discs, nylon inserted diaphragm, bolted spring chamber, and threaded connection. (AWWA C512).
- C. Backflow Preventer: Provide device which is approved by the jurisdictional water utility company. As a minimum, backflow preventer shall be per the plans or approved equivalent. Backflow preventer shall be suitable for 175 psig operating pressure and 140 degrees F operating temperature and shall be of bronze construction with screwed inlet and outlet for three inch and smaller sizes and cast iron, epoxy coated construction with 150 pound flanged inlet and outlet for four inch and larger sizes. (AWWA C510 and C511).

## **2.03 CONCRETE FOR THRUST BLOCKS**

- A. Provide Class 3000, 3/4 inch aggregate, concrete for all thrust blocks, with reinforcement where indicated or required.

## **2.04 MISCELLANEOUS METAL**

- A. Tie Rods: Stainless Steel, Type 316, threaded ANSI standard bolt thread both ends, diameter as required.
- B. Rod Couplings: Malleable iron, ASTM A197, turnbuckle design, female threaded to mate with tie rods, 5/8 inch sizes to mate with both rods and mechanical joint bolts.
- C. Pipe Clamps: For sizes 4 inches and larger, provide with malleable iron rod sockets. Provide washers in lieu of rod sockets where authorized conforming with ASTM A126, Class A, cast iron. Bolts and bolting shall conform with ASTM A307.
- D. Exposed Metal: All exposed metal (bends, bolts, glands, rings) shall be wrapped with six inch pipe wrap (tape coat HD 30).
- E. Bolts and Nuts: All bolt and nuts shall be Stainless Steel, Type 316, unless noted otherwise.

## **PART 3 EXECUTION**

### **3.01 MAINTAINING WATER SERVICES**

- A. Maintain water service and conduct operations at times selected to minimize duration and inconvenience of service interruption.
- B. Water valves in service owned by the jurisdictional water utility Owner shall be operated only by personnel of that jurisdictional water utility district.

- C. Except as specified otherwise herein, and where applicable, materials and construction methods shall be in accordance with the provisions of the jurisdictional water utility district standard drawings and specifications

### **3.02 INSTALLATION**

#### **A. Installation Requirements**

1. Excavating and backfilling, including bedding and compacting requirements, shall conform to Section 31 23 33 - Trenching and Backfilling.
2. Provide concrete thrust blocks for elbows, tees, valves, and appurtenances of buried piping. Thrust blocks shall be constructed as indicated.
3. Install piping true to line and grade, supported and guided to assure alignment under all conditions.
4. Install unions at each connection to valves.
5. Make change in line with fittings. Do not spring joints to effect change of direction.
6. Do not field cut pipe unless necessary. Make such necessary cuts by means of equipment designed for the purpose, ensuring a smooth square end.
7. For connection to existing pipe, provide pipe with suitable ends or adapters, after verification of size and type of existing pipe.

#### **B. Valves**

1. Install valves in accordance with the valve manufacturer's installation instructions.
2. Where valves are provided by the jurisdictional water utility Owner, provide suitable access for operation of valves.
3. If directed by Owner, alter typical valve manhole to suit actual conditions. Any alterations in valve manholes shall be operable from the street level. All operator nuts shall be plumb to the valve manholes.

#### **C. Thrust Blocks and Harnessing**

1. Provide for counteracting thrust caused by static and dynamic forces, including water hammer at bends, tees, reducers, valves, and dead-ends by installing harnessing as indicated or required. For other methods, submit details for approval of the Owner prior to use.
2. Provide concrete thrust blocks as indicated where harnessing is not practicable.

- D. Water Service Connectors: Make water service connections, as indicated, in accordance with California Plumbing Code and the installation instructions of the service pipe and fittings manufacturer
- E. Acceptance Requirements: After installation of pipes, ends of pipes shall be either capped or plugged. No piping shall be buried before being inspected and tested.

### 3.03 TESTS

- A. Protection from Flooding: Provide positive measures to protect exposed, installed pipe and compacted pipe bedding from flooding during testing.
- B. Notice of Testing
  - 1. Provide two days of notice of intention of testing to the Owner. The Contractor will furnish, install, and operate pumps, gages, meters, and individual pipe connections to test openings.
  - 2. Designate largest sections feasible for testing and sterilizing.
- C. Testing Requirements.
  - 1. Prior to backfilling, isolate system by use of approved valves, caps and plugs, or other means.
  - 2. Maintain such isolation throughout the performance of leakage and pressure testing.
  - 3. Where valves are used for isolation, eliminate leakage through such valves if it occurs. Maintain new work isolated from existing water mains, except for test connections, until testing and sterilization have been completed.
  - 4. For hydrostatic tests, provide approved caps and plugs in sections to be tested and remove them after testing.
  - 5. Prevent leakage in pipes and fittings at openings. Temporarily block plugged and capped ends to prevent displacement.
  - 6. Install water source connection for testing and isolated section.
  - 7. Provide labor and materials required for leakage testing, including excavation for installation and removal of pumps, gages, meters, and water source connections.
  - 8. Where leakage exceeds the Owner's standards, perform necessary corrective measures.
  - 9. Remove and replace defective pipes, joints, fittings, valves and appurtenances. Reset such items if displaced.

D. Hydrostatic Tests.

1. Perform hydrostatic tests in accordance with the Owner's requirements. All such tests shall be witnessed by the representative. The Contractor shall be responsible for making all such arrangements.
2. Test the potable water system hydrostatically in sections to a pressure of at least 225 psi for not less than 15 minutes. Pressure test pipe before backfilling. Repair leaks and retest the system until the system is leak free. Use instruments calibrated by a quality laboratory. Test sequence shall be as follows:
  - a. Lines shall be fully flushed.
  - b. Lines shall be hydrostatically tested.
  - c. Lines shall be fully flushed.
  - d. Lines shall be fully disinfected.

**3.04 SYSTEM DISINFECTION**

- A. Before final acceptance of the water supply system, each section of the new line shall be disinfected in accordance with AWWA C651. One of the following sources of disinfection shall be used:
  1. Mixture of water and chlorine gas
  2. Direct application of chlorine
  3. Mixture of water and calcium hypochlorite or
  4. Mixture of water and calcium chloride
- B. Before disinfecting, flush the line thoroughly to remove dirt and extraneous material. Clean each section of the line between valves independently.
- C. Retain the disinfectant solution in the pipe for at least 24 hours. Following this sterilization period, the residual chlorine content at the ends of the section and at other representative points shall be not less than five parts per million. Then, the line shall be drained and thoroughly flushed with water until the residual chlorine content is similar to that obtained from the existing water distribution system.
- D. Take water samples and test in accordance with AWWA C651.

### **3.05 CONNECTIONS TO EXISTING MAINS**

- A. Following testing and sterilization, new water distribution lines shall be connected to existing mains or service lateral as indicated. Each connection shall be made at a time and in a manner which will result in the least interruption of service.
- B. All connections involving shut down of jurisdictional water utility's existing facilities shall be made under the immediate supervision of the jurisdictional water utility district. No member of the Contractor's forces may operate any valve controlling the flow of water in the water utility's existing system.
- C. The Contractor shall make tie-ins to the existing system at a time which is convenient to jurisdictional water utility district, which may be in the evenings and on weekends.
- D. All piping to be abandoned, as shown on the plans, is abandoned only when the pipe has been taken out of service, physically disconnected from the active water system, and has been sealed by the Contractor.
- E. The Contractor shall seal all cut ends of the existing piping that are not connected to the new system by either installing temporary fittings on the existing pipe or by plugging the cut end with concrete extending two pipe diameters into the pipe. After the concrete placement, the pipe end shall be blocked with a two-inch thick redwood block.

**END OF SECTION**



## **SECTION 33 40 00 – SITE DRAINAGE SYSTEM**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specifications for installing storm drainage systems as indicated.

#### **1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 31 23 33 – Trenching and Backfilling.

#### **1.03 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM D3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- B. City of Petaluma Standard Plans and Specifications, Latest Edition
- C. Caltrans Standard Specifications, Latest Edition

#### **1.04 SUBMITTALS**

- A. Product Data
  - 1. Submit manufacturer's product data for pipe and pipe connection materials.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Pipe Connection Requirements
  - 1. Ends of pipe shall be bell and spigot to assure continuous alignment of pipe and leakproof joints.
- B. Polyvinyl Chloride Pipe (PVC) and Fittings
  - 1. PVC Pipe and Fittings shall conform to ASTM D3034, SDR 26

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION OF PIPE**

- A. Laying Pipe

1. Lay pipe to line and grade indicated. Bell and spigot type, lay bells in cross-cuts cut into trench. Lay pipe with the bell or grooved end uphill.
2. Prevent dirt from getting into pipe joints.
3. Remove pipe which is cracked, checked, spalled, or damaged from the work.
4. Clean interior of pipe of cement, dirt, and extraneous matter as the work progresses.

B. Pipe Joints

1. Pipe joints shall be made secure and watertight.
2. Employ appropriate equipment to draw the sections of the pipe slightly together.

C. Visual Test Method

1. Slowly pull a television camera through the storm drain and inspect for visual leaks, separated joints and cracks in the pipe. Repair leaks and joints. Replace cracked pipe. Re-inspect pipe. Submit tape of entire length of system to Owner for approval.

D. Backfilling

1. Piping shall not be covered with backfill material, until inspected, and approved by the Owner.
2. After making up pipe joints, fill space between pipe and sides of trench with backfill material half-way up the pipe. Both sides shall be filled for full width of trench at the same time and carefully compacted so as to hold the pipe in its proper position.
3. After pipe has been installed, inspected, and approved, place and compact backfill as specified in Section 31 23 33 – Trenching and Backfilling.

**END OF SECTION**