

**SPECIFICATIONS AND OTHER BIDDING AND CONTRACT DOCUMENTS**

**ALAMEDA COUNTY PROJECT #14028**  
**Environmental Health Office Remodel**  
**1131 Harbor Bay Parkway**  
**Alameda, California**

**MANDATORY PRE-BID SITE VISIT AND MEETING**

**February 14, 2017 at 2:00pm**

**Location:**

**1131 Harbor Bay Parkway, Alameda**

**ALAMEDA COUNTY**  
**GENERAL SERVICES AGENCY**  
**CAPITAL PROGRAMS**  
**1401 LAKESIDE DRIVE, #800**  
**OAKLAND, CALIFORNIA**  
**COUNTY PROJECT MANAGER: Gerald Loeper**  
**PHONE: (510) 208-9825 FAX: (510) 208-3995**

**Architecture and Engineering**  
**Shah Kawasaki Architects**  
**570 10<sup>th</sup> St. #201**  
**Oakland, CA 94607**  
**PHONE: (510) 663-6090 FAX: (510) 663-6093**



DOCUMENT 00 01 09

## **SUMMARY BIDDING CALENDAR**

NOTICE – THIS SUMMARY IS FOR INFORMATIONAL PURPOSES ONLY. The dates and times listed may not be relied upon or enforced. This summary does not form a part of the contract documents and does not establish contractual obligations.

NOTICE – THIS IS A SUMMARY ONLY AND DOES NOT LIST ALL DATES, TIMES OR TIME PERIODS CONTAINED IN THE BIDDING AND CONTRACT DOCUMENTS. All bidders and contractors must refer to the actual documents for all applicable dates, times and time periods.

<u>Event</u>	<u>Date</u>	<u>Reference</u>
Contract Documents Available	<b>January 31, 2017</b>	00 11 16 Notice to Bidders
Mandatory Pre-Bid Conference & Site Visit	<b>February 14, 2017</b>	00 11 16 Notice to Bidders
Non-mandatory Networking Conference	<b>February 15, 2017</b>	00 11 16 Notice to Bidders
Last Day for Receipt of Requests for Substitutions before Receipt of Bids	10 business days before date for Receipt of Bids	00 21 13 Instructions to Bidders
Last Day for Receipt of Questions	10 business days before date for Receipt of Bids	00 21 13 Instructions to Bidders
Receipt of Bids and Bid Opening	<b>March 8, 2017</b>	00 11 16 Notice to Bidders
Last Day for two lowest bidders to submit COP Forms 101A, 101B and 102	By 2:00 p.m. 2 business days following the Bid Opening	00 22 19 Supplementary Instructions to Bidders - Construction Outreach Program
Last Day to Submit Bid Protest	5 <sup>th</sup> Business Day from Date of Notice of Intent to Award	00 21 13 Instructions to Bidders
Estimated Date of Notice of Award	<b>April 12, 2017</b>	TBD by County
Signing of Contract	7 Calendar days after Notice of Award	00 11 16 Notice to Bidders 00 51 00 Notice of Award
Submit Post-Award Documents	7 Calendar days after Notice of Award	00 21 13 Instructions to Bidders
Last Day to Submit Escrow Bid Documentation	7 Calendar days after Notice of Award	00 56 00 Escrow Bid Documentation
Contract Duration	<b>92 Calendar days</b>	00 52 13 Agreement Form – Stipulated Sum (Single-Prime Contract)
Contract Duration Begins	<b>April 24, 2017</b>	00 55 00 Notice to Proceed
Contract Duration Ends	<b>July 24, 2017</b>	00 55 00 Notice to Proceed
Last Day to Submit Preliminary Schedule, etc. per Notice to Proceed	10 <sup>th</sup> Business Day following Notice to Proceed	00 55 00 Notice to Proceed

END OF DOCUMENT

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00 41 13	Bid Form – Stipulated Sum (Single-Prime Contract)
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**END OF SECTION**

DOCUMENT 00 01 15

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END OF DOCUMENT

DOCUMENT 00 01 20

**LIST OF SCHEDULES**

Project Duration: 92 Calendar Days

Milestones:	Issue for bids	1-30-17
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END OF DOCUMENT

DOCUMENT 00 11 16

## NOTICE TO BIDDERS

1. Notice is hereby given that The County of Alameda General Services Agency (“GSA”) Purchasing Department (“County” or “Owner”) will receive sealed bids for the following project (“Project” or “Contract”):

### Environmental Health Office Remodel

2. Sealed Bids will be received until **2:00 p.m., March 8, 2017**, at 1401 Lakeside Drive, 9<sup>th</sup> Floor, Oakland, California, at or after which time the bids will be opened and publicly read aloud. Any claim by a bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code. Any bid that is submitted after this time shall be non-responsive and returned to the bidder.

3. The Project consists of:

Converting open office space into three new offices, a small storage room, a new conference room and an expanded Main Distribution Frame room (necessary to provide Cat 6 cabling by others).

The budgetary estimate for the scope of work is **\$438,486**.

The time to complete this project is **Ninety two (92) calendar days**.

4. All bids shall be on the Bid Form Document 00 41 13 provided by the County. Each bid must conform to and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders Document 00 21 13 and the Supplementary Instructions to Bidders - Construction Outreach Program Document 00 22 19.
5. Bidders are strongly encouraged to review the Supplementary Instructions to Bidders – Enhanced Construction Outreach Program Document (ECOP) 00 22 19 and to begin their outreach efforts prior to the initial mandatory project job walk. The list of bidders solicited for this project include but are not limited to all those construction contractors listed in the GSA Small, Local & Emerging Program Vendor Query database located at [http://www.acgov.org/sleb\\_query\\_app/gsa/sleb/query/slebmnu.jsp](http://www.acgov.org/sleb_query_app/gsa/sleb/query/slebmnu.jsp).
6. To bid on this Project, the Bidder is required to possess one or more of the following State of California Contractor Licenses:

**B – General building contractor**

**C10 – Electrical Contractor**

And all other licenses associated with the scope of work.

- The Bidder's license(s) must remain active and in good standing throughout the term of the Contract.
7. A bid bond by an admitted surety insurer on the form provided by the County, cash, or a cashier's check or a certified check, drawn to the order of the County of Alameda, in the amount of **ten percent (10%) of the total bid price**, shall accompany the Bid Form, as a guarantee that the Bidder will, **within seven (7) calendar days after the date of the Notice of Award**, enter into a contract with the County for the performance of the services as stipulated in the bid.
  8. The successful Bidder shall be required to furnish a **100 % Performance Bond and a 100% Payment Bond** if it is awarded the contract for the Work.
  9. The successful Bidder may substitute securities for any monies withheld by the County to ensure performance under the Contract, in accordance with the provisions of section 22300 of the Public Contract Code.
  10. The Contractor and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to this Contract **not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work** as determined by the Director of the Department of Industrial Relations (DIR), State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the County, pursuant to sections 1770 et seq. of the California Labor Code. Prevailing wage rates are also available from the County or on the Internet at: <<http://www.dir.ca.gov>>.
  11. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. The following requirements apply to this bid and contract:
    - A. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
    - B. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
  12. The Work performed pursuant to this Contract will be subject to the requirements of the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA" as described in Project Stabilization/ Community Benefit Document 00 73 49. In consideration of the award of a Contract to perform the Work, the Contractor agrees to be party to and bound by the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF

ALAMEDA". Contractor agrees to execute the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA" Letter of Assent and shall require all of its subcontractors, of whatever tier, to become similarly bound for all work within the scope of this Contract by signing an identical Letter of Assent.

13. A mandatory pre-bid conference and site visit will be held on **February 14, 2017**, at **2:00 p.m.** at **1131 Harbor Bay Pkwy, Alameda**, California. All participants are required to sign in at the site. The site visit is expected to take approximately **two (2)** hours. If mandatory, failure to attend or arrival after the material start of the meeting will render bid ineligible. There will also be a non-mandatory networking conference held on **February 15, 2017 at 2:00p.m. at 1401 Lakeside Dr. #827, Oakland**, CA. This conference is held to help support the efforts of general contractors to find local M/WBE subcontractors to meet their ECOP compliance goals.
14. Contract Documents are available on **January 30, 2017**, for review at the office of **Shah Kawasaki Architects, 570 10<sup>th</sup> St. #201, Oakland, CA (510) 663-6090**. In addition, Contract Documents are available for bidders' review at the locations shown on Attachment 1 to this Document.

Contract Documents are also available for purchase at **East Bay Blue Print, 1745 14<sup>th</sup> Ave, Oakland, CA (510) 261-2990**. This fee is non-refundable.

15. The County has found and determined that the following item(s) shall be used on this Project based on the purpose(s) indicated. (Public Contract Code section 3400(b)): A particular material, product, thing, or service is designated by specific brand or trade name for the following purpose(s):
  - (1) In order to respond to an emergency declared by a local agency.
  - (2) **Section intentionally omitted.**
14. It is County policy to minimize the expenditure of County funds on goods and services produced by any entity which buys, sell, leases or distributes commodities and/or professional services to (1) the government of Burma; or (2) any entity organized under the laws of Burma; or (3) any entity which does business with any private or public entity located in Burma, or conducts operations in Burma. Contractors are urged to comply with the policy in making purchases and subcontracts. (ref. Alameda County, Cal., Adm. Code tit.4, §4.32.050(B),(F) )
15. Contractors must comply with County Administrative Code's CONSTRUCTION DEBRIS MANAGEMENT AND GREEN BUILDING PRACTICES. This Project is designed to meet the minimum LEED™ "Silver" rating under the LEED rating system, or a county-approved equivalent, and Contractors are required to perform all work in a manner that will not hinder LEED™ certification of the Project.

16. The County reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the County awards the Contract, the security of unsuccessful bidder(s) shall be returned **within sixty (60) days from the time the award** is made. Unless otherwise required by law, no bidder may withdraw its bid for **ninety (90) days after the date of the bid opening**.
17. The County shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on:
  - A. The **base bid amount only**.
  - B. Section intentionally omitted.
  - C. Section intentionally omitted.
  - D. Section intentionally omitted.

Determination of the responsible bidder with the lowest responsive bid will also be subject to the terms of the Enhanced Construction Outreach Program Document 00 22 19.

END OF DOCUMENT



**PLAN ROOM ADVERTISING LIST**

<input type="checkbox"/> 1	Bay Area Builders Exchange** 3055 Alvarado Street San Leandro, CA 94577 Phone: (510) 483-8880 ;Fax: (925) 685-3424 Email: <a href="mailto:planroom@bayareabx.com">planroom@bayareabx.com</a> (This is a merger of Builders Exchange of Alameda County and Contra Costa Builders Exchange 5/18/15.)	<input type="checkbox"/> 2	San Francisco Builders Exchange 850 South Van Ness Avenue San Francisco, CA 94110 Phone: (415) 282-8220 Fax: (415) 821-0363 Email: <a href="mailto:djohnsonsf@sbcglobal.net">djohnsonsf@sbcglobal.net</a>
<input type="checkbox"/> 3	Dodge Data and Analytics (Dodge Plan Room, formerly McGraw-Hill Construction Dodge) (Online) 3315 Central Avenue Hot Springs Arkansas (AR) 71913 <b>(Contact: Gerry McCarthy)</b> 626-531-6818; Fax: 626-226-1623 Email <a href="mailto:gerry.mccarthy@construction.com">gerry.mccarthy@construction.com</a>	<input type="checkbox"/> 4	Small Business Exchange 703 Market Street, Suite 1000 San Francisco, CA 94103 Phone: (415) 778-6250 Fax: (415) 778-6255 Email: <a href="mailto:sbe@sbeinc.com">sbe@sbeinc.com</a>
<input type="checkbox"/> 5	Central California Builders Exchange 1244 N. Mariposa St. Fresno, Ca 93703 Phone (559) 237-1831; Fax (559) 264-2532 Email: <a href="mailto:megan@cencalbx.com">megan@cencalbx.com</a>	<input type="checkbox"/> 6	County of Alameda Current Contracting Opportunities Website located at <a href="http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp">http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp</a>
<input type="checkbox"/> 7	The Blue Book Building & Construction Network ( <a href="http://www.bb-bid.com">www.bb-bid.com</a> Online) Contact: Amanda Limitone, Project Communication Specialist Phone: (855) 805-2560, ext.3145; Email: <a href="mailto:alimitone@thebluebook.com">alimitone@thebluebook.com</a>		
<input type="checkbox"/> 8	Reed Construction Data** – Online/Electronic Plan Room 30 Technology Parkway South, Suite 100 Norcross, GA 30092-2912 Phone: (770) 209-3396 Jeannie Kwan; Fax (Addenda only): (800) 303-8629; Fax (Notice to Bidders/IFB): (800) 642-2437; Email (addenda only): <a href="mailto:docprocessing@reedbusiness.com">docprocessing@reedbusiness.com</a> -Send requests to advertise to above address/fax/phone- Local Email: <a href="mailto:jeannie.kwan@reedbusiness.com">jeannie.kwan@reedbusiness.com</a> (EPR: <a href="http://www.reedconstructiondata.com">http://www.reedconstructiondata.com</a> )		
<input checked="" type="checkbox"/> 9	East Bay Blue Print & Supply Co. 1745 Fourteenth Ave Oakland, CA 94606 Phone: (510) 261-2990 - Sandy Petty Email: <a href="mailto:ebbp@eastbayblueprint.com">ebbp@eastbayblueprint.com</a>		
<input type="checkbox"/> 10	Construction Bidboard, Inc.(Online)** 11622 El Camino Real, Suite 100 San Diego, CA 92130 800-479-5314 phone; 619-688-0585 fax <b>(Contact Dorothy Ellithorpe <a href="mailto:dellithorpe@ebidboard.com">dellithorpe@ebidboard.com</a>)</b> <b>Alternate: <a href="mailto:planroom@ebidboard.com">planroom@ebidboard.com</a> * <a href="mailto:ebidboard@gmail.com">ebidboard@gmail.com</a></b>		

\* Plans/Specs must be sent to individual Plan Rooms to ensure posting at that location.

\*\*Construction trade journals specified for alternate bidding procedures for projects between \$25,000 and \$125,000 minimum advertising requirements. County policy is to post all construction projects over \$25,000 in all listed Plan Rooms, Press/Newspaper Publications and Local Chambers of Commerce/Trade Organizations

DOCUMENT 00 21 13

**INSTRUCTIONS TO BIDDERS**

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

County will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to County, Bidder's bid may be rejected at the sole discretion of County.

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

**#14028 Environmental Health Office Remodel** (Project Name)

2. County will receive sealed Bids from Bidders as stipulated in the Notice to Bidders Document 00 11 16.
3. Bidders must submit Bids on Bid Form 00 41 13 and all other required County forms. Bids not submitted on the County's required forms shall be deemed non-responsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible.
4. Bidders must supply all information required by each Bid Document. Bids must be full and complete. County reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Bidders must complete and submit all of the following documents with Bid Form Document 00 41 13:
  - a. Bid Bond on Bid Security Form Document 00 43 13 or other security
  - b. Designated Subcontractors List Document 00 43 36
  - c. Site-Visit Certification Document 00 45 01, if a site visit was required
  - d. Non-Collusion Affidavit Document 00 45 13
  - e. Construction Outreach Program Certifications as required by Supplementary Instructions to Bidders – Enhanced Construction Outreach Program Document 00 22 19.
  - f. Completed Debarment Form, Document 00 52 13.1.
5. Bidders must submit with their Bids cash, a cashier's check or a certified check payable to County, or a Bid Bond of not less than ten percent (10%) of amount of base Bid, plus all additive alternates. Required form of corporate surety, Bid Security Form, is provided by County and must be used and fully completed by Bidders choosing to provide a Bid Bond as security. The Surety on Bidder's Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. Bids

submitted without necessary bid security will be deemed non-responsive and will not be considered.

6. If Bidder to whom Contract is awarded shall for **SEVEN (7)** calendar days after the date of the Notice of Award, fail or neglect to enter into Contract and submit required bonds, insurance certificates, and all other required documents, County may deposit Bid Bond, cash, cashier's check, or certified check for collection, and proceeds thereof may be retained by County as liquidated damages for failure of Bidder to enter into Contract, in the sole discretion of County. It is agreed that calculation of damages County may suffer as a result of Bidder's failure to enter into the Contract would be extremely difficult and impractical to determine and that the amount of the Bidder's required bid security shall be the agreed and conclusively presumed amount of damages.
7. Bidders must submit with the Bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one-half of one percent (0.5%) of total Bid. Failure to submit this list when required by law shall result in Bid being deemed non-responsive and the Bid will not be considered.
8. If a mandatory pre-bid conference and site visit ("Site Visit") is requested as referenced in the Instructions to Bidders, then Bidders must submit the Site-Visit Certification with their Bid. County will transmit to all prospective Bidders of record such Addenda as County in its discretion considers necessary in response to questions arising at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the County as a result of the Site Visit, if any shall constitute the sole and exclusive record and statement of the results of the Site Visit.
9. Bidders shall submit the Non-Collusion Affidavit with their Bids. Bids submitted without the Non-Collusion Affidavit shall be deemed non-responsive and will not be considered.
10. Bids shall be clearly written without erasure or deletions. County reserves the right to reject any Bid containing erasures or deletions.
11. Bidders shall not modify Bid Form 00 41 13 or qualify their Bids. Bidders shall not submit to the County a scanned, re-typed, word-processed, or otherwise recreated version of Bid Form 00 41 13 or other County-provided document.
12. The successful Bidder and all its subcontractors shall pay all workers on all work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of

work performed and the locality in which the work is to be performed within the boundaries of the County, pursuant to sections 1770 et seq. of the California Labor Code.

13. Submission of Bid signifies Contractor agreement to be party to and bound by the “PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA”. Contractor agrees to execute the “PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA” Letter of Assent and shall require all of its subcontractors, of whatever tier, to become similarly bound for all work within the scope of this Contract by signing an identical Letter of Assent.
14. Submission of Bid signifies careful examination of Contract Documents and complete understanding of the nature, extent, and location of Work to be performed. Bidders must complete the tasks listed below as a condition to bidding, and submission of Bid shall constitute the Bidder's express representation to County that Bidder has fully completed the following:
  - a. Bidder 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 that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;
  - b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for such purposes;
  - c. Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;
  - d. Bidder has given County prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract

Documents and the actual conditions, and the written resolution thereof by County is acceptable to Bidder;

- e. Bidder has made a complete disclosure in writing to County of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of County or other officer or employee of County presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;
- f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by this document and that Bidder represents in its Bid Form 00 41 13 and the Agreement that it performed prior to bidding. Bidders are charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work.
- g. Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care and has been recorded in good faith. However, County only warrants, and Bidder may only rely, on the accuracy of limited types of information.
  - (1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that such information is correctly shown or indicated. This information is verifiable by independent investigation, and Bidder is required to make such verification as a condition to bidding. In submitting its Bid, Bidder shall rely on the results of its own independent investigation. In submitting its Bid, Bidder shall not rely on County-supplied information regarding above-ground conditions or as-built conditions.
  - (2) As to any subsurface condition shown or indicated in the Contract Documents, Bidder 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. County is not responsible for the completeness of such information for bidding or construction; nor is County responsible in any way for any conclusions or opinions of Bidder drawn from such information; nor is County responsible for subsurface conditions that are not specifically shown (for example, County is not responsible for soil

conditions in areas contiguous to areas where a subsurface condition is shown).

- h. Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions Information, for identification of:
- (1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents; and
  - (2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that has been utilized by Architect in preparing the Contract Documents.
  - (3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions Information, and underground facilities data, Bidder may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Bidder must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by County.
15. Bidders may examine any available "as-built" drawings of previous work by giving County reasonable advance notice. County will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Conditions Information applies to all supplied "as-built" drawings.
16. 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 County's principal office. Prevailing wage rates are also available from the County or on the internet at (<http://www.dir.ca.gov>)
17. All questions about the meaning or intent of the Contract Documents are to be directed in writing, including by e-mail, to County. Interpretations or clarifications considered necessary by County in response to such questions will be issued in writing by Addenda faxed, mailed, or delivered to all parties recorded by County as having received the Contract Documents. Questions received less than **TEN(10)** business days prior to the date for opening Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.



18. Addenda may also be issued to modify other parts of the Contract Documents as deemed advisable by County.
19. Each Bidder must acknowledge each Addendum in its Bid Form 00 41 13 by number, or its Bid shall be considered non-responsive. Addenda shall be part of the Contract Documents. A complete listing of Addenda may be secured from County.
20. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. County is not responsible and/or liable in any way for a Bidder's damages and/or claims related, in any way, to that Bidder's basing its bid on any requested substitution that County has not approved. Bidders and materials suppliers who submit requests for substitutions prior to the award of the Contract must do so in writing and in compliance with Public Contract Code section 3400. All requests must comply with the following:
  - a. County must receive any request for substitution a minimum of **TEN (10)** business days prior to bid opening.
  - b. Requests for substitutions shall contain sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.
  - c. Approved substitutions shall be listed in Addenda. County reserves the right not to act upon submittals of substitutions until after bid opening.
  - d. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Special Conditions and the Specifications.
21. All Bids must be sealed, and marked with name and address of the Bidder and the Project Number, Bid number, Bid package, and time of bid opening. Bids will be received as indicated in the Notice to Bidders.
  - a. Mark envelopes with the name of the Project.
  - b. Bids must be submitted at the place and by date and time shown in the Instructions to Bidders.
  - c. Bids must contain all documents as required herein.
22. Bids will be opened at or after the time indicated for receipt of bids.

23. This Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction that may, at the County's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work. County shall award the Contract, if it awards it at all, to the lowest responsive, responsible bidder based on the criteria as indicated in these contract documents.
24. Time for Completion: County may issue a Notice to Proceed within **NINETY (90)** calendar days from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.
- a. In the event that County desires to postpone issuing the Notice to Proceed beyond the 90-day period above, it is expressly understood that with reasonable notice to the Contractor, County may postpone issuing the Notice to Proceed.
  - b. It is further expressly understood by Bidder that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond the 90-day period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond this 90-day period shall be by written notice to County within **TEN (10)** calendar days after receipt by Contractor of County's notice of postponement.
  - c. It is further understood by Bidder that in the event that Contractor terminates the Contract as a result of postponement by County, County shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which County had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.
  - d. Should the Contractor terminate the Contract as a result of a notice of postponement, County shall have the authority to award the Contract to the next lowest responsive, responsible bidder.
25. The Bidder to whom Contract is awarded shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7<sup>TH</sup>)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles County to reject the bid as non-responsive.
- a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.



- b. Escrow of Bid Documentation: This must include all required documentation. See the document Escrow of Bid Documentation for more information.
  - c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.
  - d. Payment Bond (100%) (Contractor's Labor and Material Bond): On the form provided in the Contract Documents and fully executed as indicated on the form.
  - e. Insurance Certificates and Endorsements as required.
  - f. Workers' Compensation Certification.
  - g. Prevailing Wage and Related Labor Requirements Certification.
  - h. Hazardous Materials Certification.
  - i. Contractor's Safety Plan specifically adapted for the Project.
  - j. Executed "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA" Letter of Assent
26. Any Bid protest by any Bidder regarding any other Bid must be submitted in writing to the County's GSA–Office of Acquisition Policy, ATTN: Contract Compliance Officer, located at 1401 Lakeside Drive, 10th Floor, Oakland, CA 94612, Fax: (510) 208-9720, before 5:00 p.m. of the FIFTH (5th) business day following the date of issuance of the Notice of Intent to Award, not the date received by the Bidder. A Bid protest received after 5:00 p.m. is considered received as of the next business day.
- a. The Bid protest must contain a complete statement of the reasons and facts for the protest.
  - b. The protest must refer to the specific portions of all documents that form the basis for the protest.
  - c. The protest must include the name, address, email address, fax number and telephone number of the person representing the protesting party.
  - d. The County Agency/Department will notify all bidders of the protest as soon as possible.

- e. Upon receipt of written protest, GSA–Office of Acquisition Policy, or designee, will review and evaluate the protest and issue a written decision. The GSA–Office of Acquisition Policy, may, at its discretion, investigate the protest, obtain additional information, provide an opportunity to settle the protest by mutual agreement, and/or schedule a meeting(s) with the protesting Bidder and others (as appropriate) to discuss the protest. The decision on the bid protest will be issued at least ten (10) business days prior to the Board hearing or GSA award date.
- f. The decision will be communicated by e-mail, fax, or US Postal Service mail, and will inform the bidder whether or not the recommendation to the Board of Supervisors or GSA in the Notice of Intent to Award is going to change. A copy of the decision will be furnished to all Bidders affected by the decision. As used in this paragraph, a Bidder is affected by the decision on a Bid protest if a decision on the protest could have resulted in the Bidder not being the apparent successful Bidder on the Bid.
- g. The decision of the GSA-Office of Acquisition Policy on the bid protest may be appealed to the Auditor-Controller's Office of Contract Compliance (OCC) located at 1221 Oak St., Room 249, Oakland, CA 94612, Fax: (510) 272-6502 unless the OCC determines that it has a conflict of interest in which case an alternate will be identified to hear the appeal and all steps to be taken by OCC will be performed by the alternate. The Bidder whose Bid is the subject of the protest, all Bidders affected by the GSA-Office of Acquisition Policy's decision on the protest and the protestor have the right to appeal if not satisfied with the GSA-Office of Acquisition Policy's decision. All appeals to the Auditor-Controller's OCC shall be in writing and submitted within five (5) business days following the issuance of the decision by the GSA-Office of Acquisition Policy, not the date received by the Bidder. An appeal received after 5:00 p.m. is considered received as of the next business day. An appeal received after the FIFTH (5th) business day following the date of issuance of the decision by the GSA-Office of Acquisition Policy shall not be considered under any circumstances by the GSA or the Auditor-Controller OCC.
- h. The appeal shall specify the decision being appealed and all the facts and circumstances relied upon in support of the appeal.
- i. In reviewing protest appeals, the OCC will not re-judge the proposal(s). The appeal to the OCC shall be limited to review of the procurement process to determine if the contracting department materially erred in following the Bid or, where appropriate, County contracting policies or other laws and regulations.
- j. The appeal to the OCC also shall be limited to the grounds raised in the original protest and the decision by the GSA-Office of Acquisition Policy. As such, a

Bidder is prohibited from stating new grounds for a Bid protest in its appeal. The Auditor-Controller (OCC) shall only review the materials and conclusions reached by the GSA-Office of Acquisition Policy or department designee and will determine whether to uphold or overturn the protest decision.

- k. The Auditor's Office may overturn the results of a bid process for ethical violations by Procurement staff, County Selection Committee members, subject matter experts, or any other County staff managing or participating in the competitive bid process, regardless of timing or the contents of a bid protest.
  - l. The decision of the Auditor-Controller's OCC is the final step of the appeal process. A copy of the decision of the Auditor-Controller's OCC will be furnished to the protestor, the Bidder whose Bid is the subject of the Bid protest, and all Bidders affected by the decision.
  - m. The County will complete the Bid protest/appeal procedures set forth in this paragraph before a recommendation to award the Contract is considered by the Board of Supervisor or GSA.
  - n. The procedures and time limits set forth in this paragraph are mandatory and are each Bidder's sole and exclusive remedy in the event of Bid Protest. A Bidder's failure to timely complete both the Bid protest and appeal procedures shall be deemed a failure to exhaust administrative remedies. Failure to exhaust administrative remedies, or failure to comply otherwise 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.
27. A responsive bid is a solicited bid that has been determined to be in conformance with the conditions, completion or delivery requirements, and specifications detailed in the solicitation for bid. Responsive bids are those submitted on time; contain complete information, and required submittals and/or supporting documentation.
28. A responsible bidder is defined by the California Public Contract Code section 1103 as "a bidder who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity, and experience to satisfactorily perform this public works contract."
29. County reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if County believes that it would not be in the best interest of County 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 County. County also reserves the right to waive inconsequential deviations not involving price, time, or changes in the Work.

For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for some work items and/or enhanced prices for other work items.

30. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of the figures or numerals.
31. Prior to the award of Contract, County reserves the right to consider the responsibility of the Bidder. County may conduct investigations as County deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to County's satisfaction within the prescribed time.

END OF DOCUMENT

DOCUMENT 00 22 19

**ENHANCED CONSTRUCTION OUTREACH PROGRAM (ECOP)**

**GENERAL**

**1. PURPOSE**

1.1 It is the express purpose of the Enhanced Construction Outreach Program (ECOP) to encourage the participation in the County of Alameda, General Services Agency (GSA) capital projects of

- Minority Owned Business Enterprise (MBE),
- Woman Owned Business Enterprise (WBE),
- Local Business Enterprise (LBE) and
- Small Local Business Enterprise (SLBE)

And to ensure that all contracting firms receive an equal opportunity to bid and receive work for this project. The ECOP encourages the inclusion of small businesses in this contract in accordance with Public Contract Code § 2002.

1.2 By submitting a bid, Bidders acknowledge and agree to all Document 00 22 19 provisions contained herein.

1.3 In the event of a conflict between the terms of this Section 00 22 19 and the PROJECT STABILIZATION / COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA, the terms of the PROJECT STABILIZATION / COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA shall take priority.

**2. APPLICATION**

2.1 The provisions outlined in this Section 00 22 19 apply to this contract for the construction of the above-referenced project. This project is funded solely with local dollars, and these provisions shall apply to all work performed under any contract awarded as a result of this competitive process.

2.2 To be considered for a contract award, any bidder who fails to meet all ECOP goals identified herein shall be required to demonstrate to the satisfaction of the County that all good faith efforts (GFEs) were made in accordance with the criteria listed in Section 7.9, GFE 1-9. Failure of the bidder to demonstrate a good faith effort may result in the bid being deemed non-responsive.

**3. DEFINITIONS**

3.1 **LOCAL BUSINESS ENTERPRISE (LBE)**

3.1.1 For the purposes of this program, a Local Business Enterprise means a business that is a firm or dealer with fixed offices located in, and having a street address within the County and holds a valid business license issued by the County or a city within the County for at least 6 months prior to the date upon which a request for sealed bids or proposals is issued.

3.2 MINORITY OR WOMEN BUSINESS ENTERPRISE (MWBE)

3.2.1 For the purposes of this program, an MWBE is a Small Business Enterprise (SBE), as that term is defined by the State of California, that meets both of the following criteria:

3.2.1.1 At least 51 percent of the business is owned by one or more minority persons or women, or in the case of any business whose stock is publicly held, at least 51 percent of the stock is owned by one or more minority persons or women; and

3.2.1.2 Whose management and daily business operations are controlled by one or more minority persons or women.

3.2.2 An MWBE must be certified as such by local agencies identified or recognized by the County as having effective certification programs. When the State of California SBE definition is met, validation of the current certification by one of the following local agencies must be provided with the bid response:

Bay Area Rapid Transit (BART)

The (CPUC) Supplier Clearinghouse

Western Regional Minority Supplier Development Council (WRMSDC)

Women's Business Enterprise National Council (WBENC)

3.3 MINORITY PERSON

3.3.1 Minority person, for purposes of this section, means Black Americans, Hispanic Americans, Native Americans (including American Indians, Eskimos, Aleuts and Native Hawaiians), Asian-Pacific Americans (including persons whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the United States Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia and Taiwan).

3.4 SMALL BUSINESS ENTERPRISE (SBE)

3.4.1 For the purposes of this program, an SBE meets the current State of California definition of a small business, which is one that:

3.4.1.1 Must be independently owned and operated;

3.4.1.2 Cannot be dominant in its field of operation;

3.4.1.3 Must have its principal office located in California;

3.4.1.4 Must have its owners (or officers in the case of a corporation) domiciled in California; and

3.4.1.5 Together with its affiliates, be either:

- 3.4.1.5.1 A business with 100 or fewer employees, and an average annual gross receipts of \$14 million or less over the previous three tax years, or
- 3.4.1.5.2 A manufacturer with 100 or fewer employees.
- 3.4.1.6 An SBE must be certified or recognized as such by organizations whose certification is accepted by the California Department of General Services or by local agencies identified by the County of Alameda to have effective certification programs. Validation of the current certification by one of the following local agencies must be provided with the bid response:

Alameda County Transportation Commission (Alameda CTC)  
California Department of General Services (DGS)  
Port of Oakland  
and, when the State SBE definition is met, Alameda County (SLEB certification)

3.5 SMALL LOCAL BUSINESS ENTERPRISE (S/LBE)

- 3.5.1 For the purposes of this program, a Small Local Business Enterprise is defined by the County of Alameda and means a business that meets the SBE definition above, and is a firm or dealer with fixed offices located in, and having a street address within the County, and holds a valid business license issued by the County or a city within the County.

4. **ENHANCED CONSTRUCTION OUTREACH PROGRAM (ECOP) GOALS**

4.1 MBE PARTICIPATION SUBCONTRACTING – 15% GOAL

- 4.1.1 The MBE element of the ECOP program shall include subcontractors, manufacturers, suppliers and truckers in calculating achievement of the MBE goal. Any contractor who fails to meet the MBE goals described herein must demonstrate to the satisfaction of the County of Alameda that a good faith effort was made to meet these goals in order to be considered for a contract award.
  - 4.1.1.1 The County shall further require that in order to be awarded a contract, a prime contractor must show that a good faith effort was made to provide at least 15% of the total contract amount to MBE subcontractors, manufacturers, suppliers, and truckers.
  - 4.1.1.2 The MBE goals must be achieved by the use of MBE subcontractors, manufacturers, suppliers, and/or truckers. If the Contractor plans to perform all the work with the Contractor's own forces, the goal will still apply and must be achieved by the use of suppliers, manufacturers, and/or truckers.
  - 4.1.1.3 A certified MBE prime contractor **may not** apply the percentage of the prime contractor's work toward meeting the goals as set forth above. An MBE subcontractor meeting the definition of both an MBE and a WBE **may not** be used



to achieve both MBE and WBE required goals. The percentage of MBE firms utilized for the project described herein can only be applied to either MBE or WBE required goals. For purposes of meeting the MBE goals for this project, each participating MBE must be identified as an MBE.

- 4.1.1.4 Prime contractors are strongly encouraged to sub-contract with S/LBE certified MBEs to meet the goals.

#### 4.2 WBE PARTICIPATION SUBCONTRACTING – 5% GOAL

4.2.1 The WBE element of the ECOP program shall include subcontractors, manufacturers, suppliers and truckers in calculating achievement of the WBE goal. Any contractor who fails to meet the WBE goals described herein must demonstrate to the satisfaction of the County of Alameda that a good faith effort was made to meet these goals in order to be considered for a contract award.

- 4.2.1.1 The County shall further require that in order to be awarded a contract; a prime contractor must show that a good faith effort was made to provide at least 5% of the total contract amount to WBE subcontractors, manufacturers, suppliers, and/or truckers.

- 4.2.1.2 The WBE goals must be achieved by the use of subcontractors, manufacturers, suppliers, and/or truckers. If the Contractor plans to perform all the work with the Contractor's own forces, the goal will still apply and must be achieved by the use of manufacturers, suppliers, and/or truckers.

- 4.2.1.3 A certified WBE prime contractor **may not** apply the percentage of the prime contractor's work toward meeting the goals as set forth above. A WBE subcontractor meeting the definition of both an MBE and a WBE **may not** be used to achieve both the MBE and WBE required goals. The percentage of WBE firms utilized for the project described herein can only be applied to either MBE or WBE required goals. For purposes of meeting the WBE goals for this project, each participating WBE must be identified as a WBE.

- 4.2.1.4 Prime contractors are strongly encouraged to sub-contract with S/LBE certified WBEs to meet the goals.

#### 4.3 LBE PARTICIPATION GOALS –60% GOAL

4.3.1 The LBE element of the ECOP program shall include subcontractors, manufacturers, suppliers and/or truckers in calculating achievement of the LBE goal. Any contractor who fails to meet the LBE goals described herein must demonstrate to the satisfaction of the County of Alameda that a good faith effort was made to meet these goals in order to be considered for a contract award.



- 4.3.1.1 The County shall further require that in order to be awarded a contract, a prime contractor must show that a good faith effort was made to provide at least 60% of the total contract amount to an LBE.
- 4.3.1.2 The prime contractor may count a portion or all of its work towards meeting the goal and/or the LBE goal may be achieved by the use of subcontractors, manufacturers, suppliers, and/or truckers.

4.4 S/LBE PARTICIPATION - 20% GOAL

- 4.4.1 The S/LBE element of the ECOP program shall include subcontractors, manufacturers, suppliers and/or truckers in calculating achievement of the S/LBE goal. Any contractor who fails to meet the S/LBE goals described herein must demonstrate to the satisfaction of the County of Alameda that a good faith effort was made to meet these goals in order to be considered for a contract award.
  - 4.4.1.1 The County shall further require that in order to be awarded a contract; a prime contractor must show that a good faith effort was made to provide at least 20% of the total contract amount to an S/LBE.
  - 4.4.1.2 The prime contractor may count a portion or all of its work towards meeting the goal and/or the S/LBE goal may be achieved by the use of subcontractors, manufacturers, suppliers, and/or truckers. For purposes of meeting this goal, the 20% S/LBE participation may also be counted toward achieving the 60% LBE participation goal and/or a part of the prime contractor LBE participation.

5. **SMALL BUSINESS ENTERPRISE 5% BID PREFERENCE**

- 5.1 Prime contractors who are certified small local businesses (S/LBE) shall be eligible to receive a 5% bid preference. Prime contractors that subcontract with certified small local businesses (S/LBE) (in accordance with the Public Contract Code 2002) for a minimum 40% of the contract amount will also be eligible to receive this 5% bid preference. This bid preference shall be applied by multiplying the total Base Bid amount by .95 to determine the bid amount for comparison purposes.

6. **HIRING OF LOCAL APPRENTICES, YOUTH, UNEMPLOYED AND UNDEREMPLOYED RESIDENTS (FOR PROJECTS OVER \$125K, BUT UNDER \$1M)**

PURPOSE

- 6.1 The County of Alameda, General Services Agency (GSA), Technical Services Department (TSD) strongly encourages the hiring of local apprentices, youth, unemployed and under-employed County residents to complete the work required for this project. Those firms that can demonstrate the ability

and willingness to provide jobs required to complete this project to local apprentices, youth, unemployed and underemployed County residents should include such evidence in their bid response.

**7. GOOD FAITH EFFORTS, ECOP PACKAGE SUBMITTALS, AND EVALUATION PROCEDURES**

- 7.1 It is required that bidders exercise a good faith effort to secure the participation, as set forth in the specifications, of M/W/S/LBE subcontractors, manufacturers, suppliers and/or truckers on the project. Achievement of the ECOP goals shall constitute prima facie evidence of a Good Faith Effort (GFE). The failure of any bidder to make a good faith effort to achieve the specified participation of M/W/S/LBE subcontractors, manufacturers, suppliers and/or truckers shall be grounds for determining that the bid is non-responsive.
- 7.2 Upon request from GSA, the two responsible bidders with the lowest responsive bids must submit to the Project Manager documentation to support the ECOP goals met, and the GFEs made. The documentation submitted by each bidder shall be referred to as the ECOP Package.
- 7.3 ECOP bid submittal evaluation will initiate following GSA's determination of the two (2) responsible bidders who submitted the lowest responsive bids and their submission of the ECOP Package, which shall include, but not be limited to, ECOP Form 101A, 101B, 102A, 102B and 102C (provided separately as Excel fillable forms) and supporting documentation verifying ECOP goals met, and GFEs made. The ECOP Package is to be submitted by the two (2) responsible bidders who submitted the lowest responsive bids to GSA no later than 2:00 p.m. on the second business day following notification and request by GSA.
- 7.3.1 The individual dollar amounts to be subcontracted to the M/W/S/LBE listed in the bidder's proposal will be listed on the S/LBE Participation Information ECOP Forms 101A and 101B and the M/WBE Subcontractor Participation Information ECOP Forms 102A, 102B
- 7.3.2 ECOP Forms 101A, 101B, 102A 102B, 102C (Excel fillable forms), signature page and supporting documentation shall be delivered to the assigned Project Manager.
- 7.4 After the bids are opened, the M/W/S/LBE subcontractors, manufacturers, suppliers and/or truckers who bid to the two (2) responsible bidders with the apparent lowest responsive bids are required to provide the amounts of their bids to the County for the purposes of verification. This information shall be certified by a principal of the subcontracting firm. To the extent permitted by law, the information provided by the subcontractors, manufacturers, suppliers and/or truckers will be treated as proprietary, and will be solely for the use of County staff or its agents.
- 7.5 Each ECOP Package will be reviewed and evaluated by GSA or its agents within approximately five (5) business days of receipt unless additional time is needed to verify the submittals. Bidders must meet all the ECOP goals **OR** make all the GFEs (see section 7.9) in order for their bid to be deemed responsive.
- 7.6 The ECOP Package must be complete, submitted on a CD or flash drive, and contain legible supporting documents:

7.6.1 ECOP Forms 101A, 101B, 102A, 102B and 102C to be completed electronically and submitted on a CD or flash drive along with the hard copy signature page and supporting documentation.

7.6.2 Supporting certification documentation for the prime contractor and each subcontractor, manufacturer, supplier and/or trucker M/W/S/LBEs submitted in the order they are listed on the ECOP forms **must be submitted as hardcopy**

7.6.2.1 To be considered towards meeting the ECOP goals bidders must submit:

7.6.2.1.1 Acceptable certifying documentation for the prime contractor and its subcontractors, manufacturers, suppliers and/or truckers, as applicable (for example, local business license with proof of issue and expiration date, certification letters with expiration date).

7.6.2.1.2 Evidence that manufacturers, suppliers, and/or truckers are providing goods or services to subcontractors (for example, letter of intent, agreement)

7.6.3 Documents evidencing those good faith efforts that were made, submitted in the order listed in the table below with the corresponding item number (1-9) noted on each document.

7.6.4 Evidence of M/W/S/LBE participation (copies of bids, agreements, etc.) for all listed subcontractors, manufacturers, suppliers, and/or truckers that are *not* directly contracting with them (for example, material suppliers to subcontractors).

7.7 GSA reserves the right, as it may deem appropriate and necessary, to contact the two responsible bidders who submitted the apparent two lowest responsive bids during the evaluation process for clarification and/or submission of additional ECOP Goals or GFE documentation.

## 7.8 ECOP GOALS / GOOD FAITH EFFORTS REQUIRED

Listed in the table (below) are examples of acceptable documentation to support a determination that ECOP goals have been met

	ECOP GOALS	EXAMPLES OF ACCEPTABLE DOCUMENTATION
1	<b>60% Local Business Enterprise (LBE)</b> LBE participation may consist of the Prime Contractor and Subcontractors and may count towards the LBE, SBE, MBE and/or WBE ECOP goals.	<ul style="list-style-type: none"> <li>• Business license issued by the County of Alameda or a City within the County of Alameda and proof of date issued (which is at least 6 months prior to the date bids were solicited). OR</li> <li>• Certification letter from an acceptable certifying agency* showing a local address and issuance/expiration dates.</li> </ul>

2	<p><b>20% Certified Small Business Enterprise (SBE)</b> Certified SBEs <b>must be Local</b> (S/LBE) to be considered. S/LBE participation may consist of the Prime Contractor and Subcontractors and may count towards the LBE, SBE, MBE, and/or WBE ECOP goals.</p> <p>An SBE meets the LBE definition above and the current State definition of a small business that is &lt;100 employees and &lt;\$14 Million annual gross revenues (over the last three years).</p>	<ul style="list-style-type: none"> <li>• Same as LBE <i>PLUS</i></li> <li>• Current certification document or letter with SBE designation*</li> </ul>
3	<p><b>15% Minority-Owned Business Enterprise (MBE) Subcontractors</b> MBEs are defined per PCC 2000(e)(1), (e)(2) and (f) and are not required to be LBEs. An MWBE may count towards <u>only</u> MBE or WBE participation (not both); however, a local MBE may count towards both LBE and S/LBE ECOP goals.</p> <p>An MBE is a minority-owned business certified by one of the agencies listed below. An MBE can also be an SBE or LBE for purposes of meeting the SBE or LBE subcontracting goals, but an MBE cannot also be considered a WBE.**</p>	<ul style="list-style-type: none"> <li>• Current certification document, letter, etc., with MBE designation**</li> </ul>
4	<p><b>5% Woman-Owned Business Enterprise (WBE) Subcontractors</b> WBEs are defined per PCC 2000(e)(1), (e)(2) and (f) and are not required to be LBEs. An MWBE may count towards <u>only</u> MBE or WBE participation (not both); however, a local WBE may count both towards the LBE and S/LBE ECOP goals.</p> <p>A WBE is a minority-owned business certified by one of the agencies listed below. A WBE can also be an SBE or LBE for purposes of meeting the SBE or LBE subcontracting goals, but a WBE cannot also be considered an MBE.**</p>	<ul style="list-style-type: none"> <li>• Current certification document, letter, etc., with WBE designation**</li> </ul>

\* SBE certification from the following agencies is accepted: Alameda County Transportation Commission (Alameda CTC), California Department of General Services (DGS, Port of Oakland, and when the State SBE definition is met, Alameda County (SLEB certification).

\*\* When the State SBE definition is met MWBE certification from the following agencies is accepted:

Bay Area Rapid Transit (BART), the (CPUC) Supplier Clearinghouse, Western Regional Minority Supplier Development Council (WRMSDC), and Women's Business Enterprise National Council (WBENC).

7.9 The examples of GFE Indicators listed in the table below and suggested samples and are not meant to be mandatory or exclusionary. Other documentation may be acceptable as long as it evidences a GFE. For additional information regarding the ECOP Package submittals contact the GSA Contract Compliance Officer listed in Section IV below.

<b>Required Good Faith Effort Indicators</b>	<b>Examples of Acceptable Documentation</b>
1. The bidder attended mandatory pre-solicitation or pre-bid meetings that were scheduled by the local agency to inform all bidders of the ECOP requirements for the project for which the contract will be awarded.	<ul style="list-style-type: none"> <li>Copy of pre-bid meeting sign-in sheet (which is e-mailed to attendees and available on County Current Contracting Opportunities website listed below). The name of the firm must be listed.</li> </ul> <a href="http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp">http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp</a>
2. The bidder identified and selected specific items of the project for which the contract will be awarded to be performed by M/W/S/LBEs to provide an opportunity for participation by those enterprises.	<ul style="list-style-type: none"> <li>Copy of advertisements, certified letters, successfully completed faxes and/or other notices to M/W/S/LBEs with selected specific items identified.</li> </ul>
3. The bidder advertised, not less than ten (10) calendar days before the date the bids are opened, in one or more local daily or weekly newspapers, trade association publications, minority or trade-oriented publications, or trade journals for M/W/S/LBEs that are interested in participating in the project.	<ul style="list-style-type: none"> <li>Copy of advertisements placed showing publication name and date, and dated receipts.</li> <li>Dated receipt with ad copy.</li> </ul>
<p>4. The bidder provided written notice of his or her interest in bidding on the contract to the number of M/W/S/LBEs required to be notified by the project specifications not less than ten (10) calendar days prior to the opening of bids. The bidder may utilize the list of certified local business enterprises in the on-line County Small Local Emerging Business (SLEB) Vendor Query System located at <a href="http://www.acgov.org/sleb_query_app/gsa/sleb/query/slebmenu.jsp">http://www.acgov.org/sleb_query_app/gsa/sleb/query/slebmenu.jsp</a>.</p> <p>The minimum number of M/W/S/LBE firms required to be notified is three (3) for each item of the project selected to be performed by a M/W/S/LBE, where an M/W/S/LBE subcontractor has not been secured for that item.</p>	<ul style="list-style-type: none"> <li>Copy of dated notice, complete distribution list(s) and evidence of distribution (proof of faxes, e-mails sent etc.)</li> <li>Undelivered faxes do not count toward the effort to meet the minimum requirement</li> <li>Trades and specialties, in addition to M/W/S/LBE designation, must be clearly identified to meet the minimum requirement by using certification letter or source documentation</li> </ul>
5. The bidder followed up initial solicitations of interest by contacting the enterprises to determine with certainty whether the enterprises were interested in performing specific items of the project.	<ul style="list-style-type: none"> <li>Successfully completed telephone log containing specific dates, name of caller, person contacted and comments (i.e., why not bidding, information sent to/date)</li> </ul>

<p>6. The bidder provided interested M/W/S/LBEs with information about the plans, specifications, and requirements for the selected subcontracting or material supply work.</p>	<ul style="list-style-type: none"> <li>• Copy of published advertisements, letters, successfully completed faxes, etc. with M/W/S/LBE name/contact information including the required information or directions on how to obtain it and the date the information was provided</li> <li>• Agenda, meeting notes, etc. including specific topics discussed, M/W/S/LBE firm names and contact persons in attendance that received information, and the location and date information was provided</li> </ul>
<p>7. The bidder requested assistance from local and small business and minority and women community organizations; local and small, minority and women contractor groups, local, state, or federal M/W/S/LBE assistance offices, or other organizations that provide assistance in recruitment and placement of M/W/S/LBEs.</p>	<ul style="list-style-type: none"> <li>• Copy of dated written request and response (letter, successfully completed fax, e-mail, etc.)</li> <li>• Or 2<sup>nd</sup> written request to follow-up, if needed. Phone log is not acceptable.</li> </ul>
<p>8. The bidder negotiated in good faith with the M/W/S/LBEs and did not unjustifiably reject as unsatisfactory bids prepared by any M/W/S/LBEs as determined by GSA</p>	<ul style="list-style-type: none"> <li>• Copies or list of all bids and a spreadsheet listing all bids with firm name, contact person, bid items(s), bid price, M/W/S/LBE classification, and comments re-selection or rejection</li> <li>• M/W/S/LBE bids accepted and included in bid response</li> </ul>
<p>9. Where applicable, the bidder advised and made efforts to assist interested M/W/S/LBEs in obtaining bonds, lines of credit, or insurance required by either the GSA or the contractor.</p>	<ul style="list-style-type: none"> <li>• Copy of advertisements or other notices with specifics referencing willingness to assist M/W/S/LBEs</li> <li>• Agenda, meeting notes including presenter's name and title, specific topics discussed, handouts, etc., name of M/W/S/LBE firms in attendance, contact persons who received advice, location, and</li> </ul>

7.10 The performance by a bidder of the GFE Indicators specified in the table above shall create a rebuttable presumption, affecting the burden of producing evidence, that a bidder has made a good faith effort to comply with the goals and requirements relating to participation by M/W/S/LBEs established pursuant to Section 4 herein.

## **8. JOINT VENTURES**



- 8.1 Whenever a joint venture occurs involving either a prime or non-prime (for example, subcontractors, manufacturers, suppliers, and truckers) M/W/S/LBE firm at any level of contracting, trucking, manufacturing, or supplying, the prime contractor shall provide the County with a full account of the nature of ownership interests, the basis for creation of the joint venture, and the particular financial participation and administrative responsibilities of the interested parties. In evaluating the prime contractor's effort, the M/W/S/LBE percentage that is to be attributed to a joint venture shall be determined by multiplying the percentage of the total contract amount that is to be performed by the joint venture times the percentage of actual financial participation in the joint venture represented by the M/W/S/LBE business.

## **9. NONDISCRIMINATION**

### **9.1 Purpose**

- 9.1 The Contractor shall comply with the Americans with Disabilities Act and Title VII of the Civil Rights Act of 1964 and shall not, in regard to any position for which an employee or applicant for employment is qualified, discriminate against any employee or applicant for employment because of race, creed, color, disability, sex, sexual orientation, political affiliation, or by any other non-merit factors be otherwise subjected to discrimination. The Contractor shall apply the ECOP that ensures applicants are employed, and that employees are treated during employment without regard to their race, age, religion, Vietnam Era Veteran's status, political affiliation, or any other non-merit factors. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other terms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
- 9.2 Contractor shall, in all solicitations or advertisements for employees placed on behalf of the County, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, disability, sex, sexual orientation or national origin, age, religion, Vietnam Era Veteran's status, political affiliation, or any other non-merit factors.

## **SECTION II**

### **CONTRACT COMPLIANCE REQUIREMENTS**

#### **1. APPLICATION**

- 1.1 The following provisions shall apply to all contracts subject to the provisions of Section I and/or Section IV.

#### **2. ALAMEDA COUNTY CONTRACT COMPLIANCE SYSTEM**

- 2.1 Alameda County utilizes the Elation Systems contract compliance application as part of its commitment to assist contractors to comply with certain legal and contractual requirements. The

Elation Systems, a secure web-based computer system, was implemented to monitor compliance and to track and report M/W/S/LBE participation in County contracts.

- 2.2 The prime contractor and all participating local and M/W/S/LBE subcontractors awarded contracts as a result of the bid process for this project are required to use the Elation System to submit ECOP information including, but not limited to, weekly certified payrolls, monthly progress payment reports and other information related to M/W/S/LBE participation. Use of the Elation System, support and training is available at no charge to prime and subcontractors participating in County contracts.
- 2.3 Upon contract award:
  - 2.3.1 The County will provide contractors and subcontractors participating in any contract awarded as a result of this bid process, a code that will allow them to register and use the Elation System free of charge.
  - 2.3.2 Contractors should schedule a representative from their office/company, along with each of their subcontractors, to attend Elation Systems training.
    - 2.3.2.1 Free multi-agency Elation Systems one-hour training sessions require reservations and are held monthly in the Pleasanton, California area.
- 2.4 It is the Contractor's responsibility to ensure that they and their subcontractors are registered and trained as required to utilize Elation Systems.
  - 2.4.1 For systems support visit Elation Systems online at <http://www.elationsys.com/> or contact them at (925) 924-0340.
  - 2.4.2 If you have questions regarding the utilization of the Elation Systems, please contact the Project Manager.

### **3. MEETINGS**

- 3.1 After the award of the contract and prior to beginning work, the General Services Agency may hold a pre-construction conference at which a representative of the Contractor and of each subcontractor must attend. As it becomes necessary during the course of the contract, the General Services Agency may call meetings of the Contractor and pertinent subcontractors.

### **4. INFORMATION AND RECORDS**

- 4.1 For the purposes of determining compliance with this program, the Contractor shall provide the County with access to all records and documents that relate to M/W/S/LBE participation. To the extent permitted by applicable law, proprietary information will be safeguarded.
- 4.2 The Contractor must submit the following information to the General Services Agency on Alameda County approved forms. All subcontractor submittals must be through the prime contractor.



- 4.2.1 S/LBE Participation Information and M/WBE Subcontractor Participation Information, (ECOP Forms 101A, 101B, 102A, and 102B provided separately as Excel fillable forms) submitted no later than 2:00 p.m. on the second business day following notification and request by GSA.
- 4.2.2 Checklist for Review of Good Faith Efforts (ECOP Form 102C (also provided separately) submitted no later than 2:00 p.m. on the second business day following notification and request by GSA.

## 5. SUBSTITUTION OF M/W/S/LBE FIRMS

- 5.1 Substitution of other **firms** (subcontractors at any level, manufacturers, suppliers and/or truckers) for those listed in the proposal on the sheet entitled M/WBE Subcontractor Participation Information or S/LBE Participation Information shall not be made without prior approval of the County, and shall be in accordance with State or Federal law where applicable.

## SECTION III

### NON-COMPLIANCE WITH ECOP

#### 1. APPLICATION

- 9.3 The following provisions shall apply to all contracts subject to the provisions of Section I and/or Section IV.

#### 2. DETERMINATION OF NON-COMPLIANCE

- 9.4 During the performance of the contract, if the General Services Agency has reason to believe or finds that the Contractor has not met the ECOP requirements in the contract, the Director of the General Services Agency (or the Director's designee) shall hold a meeting with the Contractor for the purpose of determining whether the Contractor is out of compliance. If after the meeting the Contractor is found to be out of compliance, the Contractor will be notified of a public hearing. The public hearing will be held before the Board of Supervisors with a minimum five calendar-day notice given to the Contractor. If the Board of Supervisors finds that there has been a violation, the County will notify the Contractor in writing of the sanctions to be imposed by the Board.

#### 3. SANCTIONS

- 9.5 A finding at the public hearing that there has been a violation of the ECOP requirements of the contract shall be cause for the Board of Supervisors to impose any or all of the following sanctions:
  - 9.5.1 Withhold an additional ten percent (10%) of all further contract progress payments until the Contractor provides evidence satisfactory to the Board of Supervisors that the condition of noncompliance has been corrected.
  - 9.5.2 Suspend the contract until such time as the Contractor provides evidence satisfactory to the Board of Supervisors that the condition of noncompliance has been corrected.

- 9.5.3 Terminate the contract and collect appropriate damages from the Contractor.
- 9.5.4 Declare that the Contractor is not a responsible bidder, and is ineligible to make bids on future County contracts for a stated period of time or until the Contractor can demonstrate to the satisfaction of the Board of Supervisors that the violation has been corrected.

## **SECTION IV**

### **1. OUTREACH**

- 1.1 To promote the ECOP goals and assist contractors and subcontractors in their efforts to develop the relationships they may require to meet the ECOP goals for this project, the County will
  - 1.1.1 E-mail the Notice to Bidders to vendors in the County Vendor Database and other sources. Advertise the project once a week for at least 2 consecutive weeks in a newspaper of general circulation in the county where the project is located, trade organizations and chambers of commerce, and plan rooms. Notice of this project will also be posted on the County Current Contracting Opportunities and Calendar of Events websites (see website URL addresses below).
  - 1.1.2 Incorporate a networking and informational component in the mandatory bid walk/site visit.
  - 1.1.3 Provide information about the project, the ECOP, and other current and upcoming projects at the bid conference/networking meeting.
  - 1.1.4 E-mail the list of attendees from the mandatory bid walk to each attendee when issuing the first Addendum for the Project and post the attendance and first Addendum on the Current Contracting Opportunities website.

### **2. CONTRACTOR RESOURCES**

The following sources may be contacted for assistance in soliciting M/W/S/LBE participation:

#### **Asian American Contractors Association**

Juliana Choy Sommer, President

(415) 642-1818

[www.aaca-sf.com](http://www.aaca-sf.com)

#### **Western Regional Minority Supplier Development Council (WRMSDC) –**

##### **MBE certifications only**

80 Swan Way, Suite 245

Oakland, CA 94621

(510) 686-2555

[www.wrmsdc.org](http://www.wrmsdc.org)

#### **Women's Business Enterprise National Council (WBENC)**

WBE certifications only – [www.wbenc.org](http://www.wbenc.org)

Visit the following County of Alameda GSA websites for

<b>CERTIFIED SMALL LOCAL VENDORS</b>	<a href="http://www.acgov.org/sleb_query_app/gsa/sleb/query/slebresultlist.jsp?smEmInd=C">http://www.acgov.org/sleb_query_app/gsa/sleb/query/slebresultlist.jsp?smEmInd=C</a>
<b>CURRENT CONTRACT OPPORTUNITIES</b>	<a href="http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp">http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/contractopportunities.jsp</a>
<b>UPCOMING CONTRACT OPPORTUNITIES</b>	<a href="http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/futurecontractopportunities.jsp">http://www.acgov.org/gsa_app/gsa/purchasing/bid_content/futurecontractopportunities.jsp</a>
<b>CALENDAR OF EVENTS</b>	<a href="http://www.acgov.org/calendar_app/DisplayListServlet?site=Internet&amp;ag=GSA&amp;ty=PUR">http://www.acgov.org/calendar_app/DisplayListServlet?site=Internet&amp;ag=GSA&amp;ty=PUR</a>
<b>COUNTY OF ALAMEDA HOME PAGE</b>	<a href="http://www.acgov.org/index.htm">http://www.acgov.org/index.htm</a>

## BIDDER INFORMATION AND ACCEPTANCE

*(Submit hardcopy of this completed page along with all hardcopy ECOP supporting documentation.)*

The undersigned has read and agrees to the Supplementary Instructions to Bidders – Enhanced Construction Outreach Program, Document 00 22 19 of the Bid packet and declares that the ECOP Forms 101A, 101B, 102A, 102B and 102C (Excel Fillable Forms provided separately) have been completed accurately by the Prime Firm submitting the bid.

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

Street Address Line 1: \_\_\_\_\_

Street Address Line 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Webpage: \_\_\_\_\_

Type of Entity / Organizational Structure (check one):

☐ Corporation

☐ Joint Venture

☐ Limited Liability Partnership

☐ Partnership

☐ Limited Liability Corporation

☐ Non-Profit / Church

☐ Other: \_\_\_\_\_

Jurisdiction of Organization Structure: \_\_\_\_\_

Date of Organization Structure: \_\_\_\_\_

Federal Tax Identification Number: \_\_\_\_\_

Primary Contact Information:

Name / Title: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

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

**SIGNATURE:** \_\_\_\_\_

Name and Title of Signer: \_\_\_\_\_

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_

END OF DOCUMENT

DOCUMENT 00 41 13

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

To: The County of Alameda

From: \_\_\_\_\_  
(Proper Name of Bidder)

The undersigned declares that the Contract Documents including, without limitation, the Notice to Bidders Document 00 11 16, the Instructions to Bidders Document 00 21 13 and the Supplementary Instructions to Bidders – Construction Outreach Program Document 00 22 19 have been read and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications.

PROJECT: **Environmental Health Office Remodel**

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

_____ dollars      \$ _____
<b><i>TOTAL BASE BID</i></b>

**Additive/Deductive Alternates:**

**Alternate #1**

_____ dollars      \$ _____
Additive: Provide 600amp distribution panel LD in Main Electrical Room per Electrical Drawings.

**Alternate #2**

_____ dollars      \$ _____
(ADD DESCRIPTION) Additive/Deductive

**Alternate #3**

_____ dollars      \$ _____
(ADD DESCRIPTION) Additive/Deductive

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

1. **Unit Prices.** The Bidder's Base Bid includes the following unit prices, which the Bidder must provide and County may, at its discretion, utilize in valuing additive and/or deductive change orders.
2. The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this Bid, understands the construction and project management function(s) described in the Contract Documents, and that each Bidder who is awarded a contract shall be, in fact, a prime contractor, not a subcontractor, to County, and agrees that its Bid, if accepted by County, will be the basis for the Bidder to enter into a contract with County in accordance with the intent of the Contract Documents.
3. The undersigned has notified County in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the County Project Manager before bid date to verify the issuance of any clarifying Addenda.
4. The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.

5. The liquidated damages clause of the General Conditions and Agreement is hereby acknowledged.
6. It is understood that County reserves the right to reject this bid and that the bid shall remain open to acceptance and is **irrevocable for a period of ninety (90) days**.
7. The following documents are attached hereto:
  - a. **Bid Bond** on Bid Security Form Document 00 43 13 or other security
  - b. **Designated Subcontractors List** Document 00 43 36
  - c. **Site-Visit Certification** Document 00 45 01, if a site visit was required
  - d. **Non-Collusion Affidavit** Document 00 45 13
  - e. **Construction Outreach Program Certifications** as required by Supplementary Instructions to Bidders - Construction Outreach Program Document 00 22 19
  - f. Completed **Debarment Form**, Document 00 52 13.1

Receipt and acceptance of the following addenda is hereby acknowledged:

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

8. Bidder acknowledges that the licenses required for performance of the Work are a **B General Building Contractor, C10 Electrical Contractor** and any other licenses necessary to complete the scope of work.
9. The undersigned hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.
10. The Bidder represents that it is competent, knowledgeable and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions

existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.

11. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.
12. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), County will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.
13. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.
14. Section intentionally omitted.

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

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 2016

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

Type of Organization: \_\_\_\_\_

Signed by \_\_\_\_\_

Title of Signer: \_\_\_\_\_

Address of Bidder: \_\_\_\_\_

Taxpayer's Identification No. of Bidder: \_\_\_\_\_

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

Fax Number: \_\_\_\_\_



E-mail: \_\_\_\_\_ Web page: \_\_\_\_\_

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

No.: \_\_\_\_\_ Class: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

No.: \_\_\_\_\_ Class: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Department of Industrial Relations Registration Number: \_\_\_\_\_

If Bidder is a corporation, affix corporate seal.

Name of Corporation: \_\_\_\_\_

President: \_\_\_\_\_

Secretary: \_\_\_\_\_

Treasurer: \_\_\_\_\_

Manager: \_\_\_\_\_

END OF DOCUMENT

DOCUMENT 00 43 13

**BID SECURITY FORM**  
**(Bid Bond)**

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

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned, as \_\_\_\_\_ as Principal ("Principal"),

and \_\_\_\_\_ as Surety ("Surety"),

a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ and authorized to do business as a surety in the State of California, are held and firmly bound unto the County of Alameda, State of California as Obligee, in the sum of

\_\_\_\_\_ (\$ \_\_\_\_\_)

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

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

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

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

time, alteration or addition to the terms of the Contract or the call for bids, or to the work, or to the specifications.

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

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

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

(Affix Corporate Seal)

\_\_\_\_\_  
Principal

\_\_\_\_\_  
By

(Affix Corporate Seal)

\_\_\_\_\_  
Surety

\_\_\_\_\_  
By

\_\_\_\_\_  
Name of California Agent of Surety

\_\_\_\_\_  
Address of California Agent of Surety

\_\_\_\_\_  
Telephone Number of California Agent of Surety

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

END OF DOCUMENT

DOCUMENT 00 43 36

## DESIGNATED SUBCONTRACTORS LIST

PROJECT: **Environmental Health Office Remodel**

Bidder must list hereinafter the name and location of each subcontractor who will be employed, and the kind of Work that each will perform if the Contract is awarded to the Bidder. Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., it must clearly set forth below the name and location of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work in an amount **in excess of one-half of one percent (1/2 of 1%) of Bidder's total Bid**, and that as to any Work that Bidder fails to list, Bidder agrees to perform that portion itself or be subjected to penalty under applicable law.

In case more than one subcontractor is named for the same kind of Work, state the portion that each will perform. Vendors or suppliers of materials only do not need to be listed.

If further space is required for the list of proposed subcontractors, additional sheets showing the required information, as indicated below, shall be attached hereto and made a part of this document.

Name and City of Subcontractor (1) (4)	Description of Work: Reference to Contract Items (1)	Prices Under Subcontract (2) (3)	Subcontractor's License Numbers.		
			State of California Contractor's License (2)	Dept. of Industrial Relations Registration No. (DIR) (2)	Business License and City/County Issued (2)

(Bidder to attach additional sheet(s) if necessary)

- (1) Submit this information with sealed bid.
- (2) This information shall be required of the two (2) apparent low bidders, no later than two days following the bid opening. **DO NOT SUBMIT WITH BID.**
- (3) Dollar amounts will be treated as proprietary and will solely be for the use of County staff. **DO NOT SUBMIT WITH BID.**
- (4) Submit full address of Subcontractors two days following bid opening.

END OF DOCUMENT

DOCUMENT 00 45 01

**SITE-VISIT CERTIFICATION**

For Projects Where A Site Visit Was Mandatory

PROJECT: **Environmental Health Office Remodel**

Check whichever option applies:

\_\_\_\_\_ I certify that I visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

\_\_\_\_\_ I certify that \_\_\_\_\_ (Bidder's representative) visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully indemnifies the County of Alameda, its Architect, its Engineer, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any damage, or omissions, related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

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

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

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

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

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

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

END OF DOCUMENT

# NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA )  
 ) ss.  
COUNTY OF \_\_\_\_\_)

**NON-COLLUSION AFFIDAVIT**  
**DOCUMENT 00 45 13**



DOCUMENT 00 45 26

## WORKERS' COMPENSATION CERTIFICATION

PROJECT NO.: **14028** between County of Alameda (the "County" or the "Owner") and  
\_\_\_\_\_ (the "Contractor" or the "Bidder")  
(the "Contract" or the "Project").

Labor Code section 3700 in relevant part provides:

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

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

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

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

Proper Name of Contractor: \_\_\_\_\_

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

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

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

(In accordance with Article 5 - commencing at section 1860, chapter 1, part 7, division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any Work under this Contract.)

END OF DOCUMENT

DOCUMENT 00 45 46.01

**PREVAILING WAGE AND  
RELATED LABOR REQUIREMENTS CERTIFICATION**

PROJECT NO.: **14028** between County of Alameda (the “County” or the “Owner”) and  
\_\_\_\_\_ (“Contractor” or the “Bidder”)  
 (“Contract” or the “Project”).

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits **with 48-hours notice**, payroll records, and apprentice and trainee employment requirements, for all Work on the above Project.

I hereby acknowledge that County will use the Alameda County Contract Compliance System, including the Elation Systems, Inc. program, to monitor contract labor compliance and Local Hiring Program compliance monitoring. Contractor shall use these Compliance Systems to meet County’s requirements, and shall participate in training as directed by County in order to become and remain competent in the use of the Compliance Systems. Costs associated with the Alameda County Contract Compliance System, including the Elation Systems, Inc. programs shall be borne by Contractor and shall not increase the cost of the Contract.

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

Proper Name of Contractor: \_\_\_\_\_

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

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

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

END OF DOCUMENT

DOCUMENT 00 45 46.04

## HAZARDOUS MATERIALS CERTIFICATION

PROJECT NO.: **14028** (“Contract” or “Project”) between the County of Alameda (“County”) and \_\_\_\_\_ (“Contractor”).

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

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

Proper Name of Contractor: \_\_\_\_\_

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

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

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

END OF DOCUMENT

DOCUMENT 00 45 46.06

## IMPORTED MATERIALS CERTIFICATION

PROJECT NO.: **14028** between the County of Alameda ("County" or "Owner") and

\_\_\_\_\_ ("Contractor") ("Contract" or  
"Project").

This form shall be executed by the Contractor and by all entities that, in any way, provide or deliver and/or supply any soils, aggregate, or related materials ("Fill") to the Project Site. All Fill shall satisfy all requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, and section 21000 et seq. of the Public Resources Code ("CEQA").

To the furthest extent permitted by California law, Contractor shall defend, indemnify, and hold harmless the County, its agents, representatives, officers, consultants, employees, trustees, and volunteers pursuant to the indemnification provisions in the Contract Documents for, without limitation, any claim(s) connected with providing, delivering, and/or supplying Fill.

Certification of: ☐ Delivery Firm/Transporter ☐ Supplier ☐ Manufacturer  
☐ Wholesaler ☐ Broker ☐ Retailer  
☐ Distributor ☐ Other \_\_\_\_\_

Type of Entity ☐ Corporation ☐ General Partnership  
☐ Limited Partnership ☐ Limited Liability Company  
☐ Sole Proprietorship ☐ Other \_\_\_\_\_

Name of firm ("Firm"): \_\_\_\_\_

Mailing address: \_\_\_\_\_

Addresses of branch office used for this Project: \_\_\_\_\_

If subsidiary, name and address of parent company: \_\_\_\_\_

By my signature below, I hereby certify that I am aware of section 25260 of the Health and Safety Code and the sections referenced therein regarding the definition of hazardous material. I further certify on behalf of the Firm that all soils, aggregates, or related materials provided,

delivered, and/or supplied or that will be provided, delivered, and/or supplied by this Firm to the Project Site are free of any and all hazardous material as defined in section 25260 of the Health and Safety Code. I further certify that I am authorized to make this certification on behalf of the Firm.

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

Proper Name of Contractor: \_\_\_\_\_

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

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

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

END OF DOCUMENT

DOCUMENT 00 51 00

**NOTICE OF AWARD**

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

To: \_\_\_\_\_  
(Contractor)

To: \_\_\_\_\_  
(Address)

From: The County of Alameda

PROJECT: **Environmental Health Office Remodel**

("Project" or "Contract").

Contractor has been awarded the referenced Contract on \_\_\_\_\_, 2017, by action of the County's Board of Supervisors.

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

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

The Bidder to whom Contract is awarded shall execute and submit the following documents by **5:00 p.m. of the SEVENTH (7<sup>TH</sup>) Calendar day following the date of the Notice of Award.** Failure to properly and timely submit these documents entitles County to reject the bid as non-responsive.

- a. **Agreement:** To be executed by successful Bidder. **Submit five (5) copies**, each bearing an original signature.
- b. **Escrow of Bid Documentation:** This must include all required documentation. See the document Escrow of Bid Documentation for more information.
- c. **Performance Bond (100%):** On the form provided in the Contract Documents and fully executed as indicated on the form, Document 00 61 13.13.
- d. **Payment Bond (100%) (Contractor's Labor and Material Payment Bond):** On the form provided in the Contract Documents and fully executed as indicated on the form, Document 00 61 13.16.

- e. **Insurance Certificates** and Endorsements as required.
- f. **Workers' Compensation Certification, Document 00 45 26.**
- g. Prevailing Wage and Related **Labor Requirements Certification, Document 00 45 46.01.**
- h. **Hazardous Materials Certification, Document 00 45 46.04.**
- i. **Imported Materials Certification, Document 00 45 46.06.**
- j. Completed, signed Document 00 52 13.1 **Debarment And Suspension Certification Form**

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

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

The County of Alameda

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

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

END OF DOCUMENT



DOCUMENT 00 51 13

## NOTICE OF INTENT TO AWARD

[DATE]

[NAME]

[COMPANY] – NOTE: SEND ONE TO EACH BIDDER

[ADDRESS]

[CITY, STATE ZIP]

SUBJECT: INTENT TO AWARD A CONTRACT FOR PROJECT NO. 14028

Thank you for your participation and interest in the County of Alameda. Based on its evaluation and acceptance of the bids submitted, GSA will be recommending to its Board of Supervisors that the contract for project number 14028 be awarded to [CONTRACTOR].

GSA's recommendation to accept and award a contract should go before the Board on Tuesday, March 14, 2017. Upon Board approval a draft contract will be submitted to the awardee for review.

Below is a summary of all bids/proposals received for this project.

Bidder	Location	Bid Price*

[Add as necessary the statement below]

(\*) – A 5% bid preference (stipulated in the ECOP) was given to \_\_\_\_\_; therefore, their bid is evaluated at \$\_\_\_\_\_ which makes them the lowest responsive bidder.

Any bid protest by any Bidder regarding any other bid must be submitted in writing **by the fifth (5<sup>th</sup>) calendar day following the date of this notice**. Please refer to Document 00 21 13 - Instructions To Bidders for submittal requirements. The bid protest procedure and time limits set forth in Document 00 21 13 are mandatory and are your sole and exclusive remedy in the event of a bid protest.

For information on other contracting opportunities please visit our websites at [http://www.acgov.org/gsa/purchasing/bid\\_content/FutureContractOpportunities.jsp](http://www.acgov.org/gsa/purchasing/bid_content/FutureContractOpportunities.jsp) for Upcoming Contracting Opportunities and [http://www.acgov.org/gsa/purchasing/bid\\_content/ContractOpportunities.jsp](http://www.acgov.org/gsa/purchasing/bid_content/ContractOpportunities.jsp) for Current Contracting Opportunities.

The County of Alameda

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

NAME: **Gerald K. Loeper**

TITLE: **Architect**, Project Manager

END OF DOCUMENT

DOCUMENT 00 52 13

**AGREEMENT FORM – STIPULATED SUM**  
(SINGLE-PRIME CONTRACT)

THIS AGREEMENT IS MADE AND ENTERED INTO THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2017, by and between the County of Alameda (County”) and \_\_\_\_\_ (“Contractor”) (“Agreement”).

**WITNESSETH:** That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other, as follows:

1. **The Work:** Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of

PROJECT: **Environmental Health Office Remodel**  
 (“Project” or “Contract” or “Work”)

for which the Drawings and Specifications are identified by the signature of the parties to this Agreement. It is understood and agreed that the Work shall be performed and completed as required in the Contract Documents including, without limitation, the Drawings and Specifications, under the direction and supervision of, and subject to, the approval of County or its authorized representative.

2. **The Contract Documents:** The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. Any and all obligations of the County and Contractor are fully set forth and described in the Contract Documents. All Contract Documents are intended to cooperate so that any Work called for in one and not mentioned in the other or vice versa is to be executed the same as if mentioned in all Contract Documents.
3. **Interpretation of Contract Documents:** Should any question arise concerning the intent or meaning of Contract Documents, including the Drawings or Specifications, the question shall be submitted to the County for interpretation. If a conflict exists in the Contract Documents, modifications, beginning with the most recent, shall control over this Agreement, which shall control over the Special Conditions, which shall control over the General Conditions, which shall control over the remaining Division 00 documents, which shall control over Division 01 Documents, which shall control over Division 02 through Division 49 documents, which shall control over figured dimensions, which shall control over large-scale drawings, which shall control over small-scale drawings. **In no case shall a document calling for lower quality and/or quantity material or workmanship control.** The decision of County in the matter shall be final.

4. **Time For Completion:** It is hereby understood and agreed that the work under this contract shall be completed within **Ninety Two (92)** consecutive calendar days (“Contract Time”) from the date specified in the County's Notice to Proceed.
5. **Completion-Extension Of Time:** Should the Contractor fail to complete this Contract, and the Work provided herein, within the time fixed for completion, due allowance being made for the contingencies provided for herein, the Contractor shall become liable to the County for all loss and damage that the County may suffer on account thereof. The Contractor shall coordinate its work with the Work of all other contractors. County shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that will allow timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the work of other contractors.
6. **Liquidated Damages:** Time is of the essence for all work under this Agreement. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that County will sustain in the event of and by reason of Contractor's delay; therefore, Contractor agrees that it shall pay to the County the sum of **Seven Hundred Fifty dollars (\$750.00) per day** as liquidated damages for each and every day's delay beyond the time herein prescribed in finishing the Work. It is hereby understood and agreed that this amount is not a penalty.

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

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

7. **Indemnity:** To the fullest extent permitted by law (including, without limitation, California Civil Code Section 2782), Contractor shall defend (with legal counsel reasonably acceptable to the County), indemnify and hold harmless County and its officers, agents, departments, officials, representatives and employees (collectively “Indemnitees”) from and against any and all claims, loss, cost, damage, injury (including, without limitation, injury to or death of an employee of Contractor or its Subcontractors), expense and liability of every kind, nature and description (including, without limitation, incidental and consequential damages, court costs, attorneys’ fees, litigation expenses and fees of expert consultants or expert witnesses incurred in connection therewith and costs of investigation) which arises out of or is in any way connected to the performance of this agreement (collectively

**“Liabilities”) except where such Liabilities are caused solely by the negligence or willful misconduct of any indemnitee. The County may participate in the defense of any such claim without relieving Contractor of any obligation hereunder. This indemnification, defense, and hold harmless obligation includes any failure or alleged failure by Contractor to comply with any provision of law or the Contract Documents, including, without limitation, any stop notice actions, or liens by the California Department of Labor Standards Enforcement. This indemnity obligation shall be for the full amount of all damage to County, including defense costs, and shall not be limited by any insurance limits.**

- 7.1 Contractor shall defend (with legal counsel reasonably acceptable to the County), indemnify and hold harmless the Indemnitees from all loss, cost, damage, expense, liability or claims, in law or in equity, including attorneys’ fees, court costs, litigation expenses and fees of expert consultants or expert witnesses, that may at any time arise for any infringement of the patent rights, copyright, trade secret, trade name, trademark, service mark or any other proprietary right of any person or persons in consequence of the use by County, or any of the other Indemnitees, of articles or Services to be supplied in the performance of this Agreement.
- 7.2 Contractor shall place in its subcontracting agreements and cause its Subcontractors to agree to indemnities and insurance obligations in favor of County and other Indemnitees in the exact form and substance of those contained in this Agreement. Contractor shall require all subcontractors to comply with all indemnification and insurance requirements of this agreement, including, without limitation, Exhibit C. Contractor shall verify subcontractor’s compliance.
8. **Loss Or Damage:** County and its authorized representatives shall not in any way or manner be answerable or suffer loss, damage, expense, or liability for any loss or damage that may happen to the Work, or any part thereof, or in or about the same during its construction and before acceptance, and the Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatever; and shall hold County and its authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatever.
9. **Insurance and Bonds:** Contractor shall provide all required certificates of insurance, and payment and performance bonds as evidence thereof.
10. **Prosecution of Work:** If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, County, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

11. **Authority of Architect:** Contractor hereby acknowledges that the Architect has authority to approve and/or stop Work if the Contractor's Work does not comply with the requirements of the Contract Documents and all applicable laws. The Contractor shall be liable for any delay caused by its non-compliant Work.
12. **Assignment of Contract:** Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by the Contractor without the written approval of the County, nor without the written consent of the Surety on the Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.
13. **Classification Of Contractor's License:** Contractor hereby acknowledges that it currently holds valid **Type B General Building Contractor, C10 Electrical Contractor** (and any other license necessary to complete the scope of work) Contractor's license(s) issued by the State of California, Contractor's State Licensing Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.
14. It is County policy to minimize the expenditure of County funds on goods and services produced by any entity which buys, sell, leases or distributes commodities and/or professional services to (1) the government of Burma; or (2) any entity organized under the laws of Burma; or (3) any entity which does business with any private or public entity located in Burma, or conducts operations in Burma. Contractors are urged to comply with the policy in making purchases and subcontracts. (ref. Alameda County, Cal., Adm. Code Title.4, §4.32.050(B),(F) )
15. **Payment of Prevailing Wages:** The Contractor and all Subcontractors under the Contractor shall pay all workers on all Work performed pursuant to this Contract **not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work** as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of County, pursuant to sections 1770 et seq. of the California Labor Code.
16. **Contract Price:** In consideration of the foregoing covenants, promises, and agreements on the part of the Contractor, and the strict and literal fulfillment of each and every covenant, promise, and agreement, and as compensation agreed upon for the Work and construction, erection, and completion as aforesaid, County covenants, promises, and agrees that it will well and truly pay and cause to be paid to the Contractor in full, and as the full Contract Price and compensation for construction, erection, and completion of the Work hereinabove agreed to be performed by the Contractor, the following price:  

Dollars (\$ \_\_\_\_\_),

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

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

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

**CONTRACTOR**

**COUNTY OF ALAMEDA**

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

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

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

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

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

Approved as to form: \_\_\_\_\_  
(Deputy) County Counsel

I hereby certify under penalty of perjury that the President of the Board of Supervisors was duly authorized to execute this document on behalf of the County of Alameda by a majority vote of the Board on \_\_\_\_\_, 2017; and that a copy has been delivered to the President as provided by Government Code Section 25103.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Clerk of the Board of Supervisors,  
County of Alameda, State of California

END OF DOCUMENT

ALAMEDA COUNTY GSA-CP

AGREEMENT FORM – STIPULATED SUM  
(SINGLE-PRIME CONTRACT)  
DOCUMENT 00 52 13  
Revised 8/13/14



DOCUMENT 00 52 13.1

COUNTY OF ALAMEDA  
**DEBARMENT AND SUSPENSION CERTIFICATION FORM**

The bidder, under penalty of perjury, certifies that, except as noted below, bidder, its Principal, and any named and unnamed subcontractor:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency **within the past three years**;
- Does not have a proposed debarment pending; and
- Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct **within the past three years**.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessary result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

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

PRINCIPAL: \_\_\_\_\_ TITLE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

END OF DOCUMENT

DOCUMENT 00 55 00

**NOTICE TO PROCEED**

Dated: \_\_\_\_\_, 2017

TO: \_\_\_\_\_  
(Contractor)

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT: **Environmental Health Office Remodel**

PROJECT NO.: **14028** between County of Alameda and Contractor ("Contract").

You are notified that the Contract Time under the above Contract will commence to run on \_\_\_\_\_, 2017. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the date of completion is \_\_\_\_\_, 2017.

You must submit the following documents by **5:00 p.m. of the TENTH (10<sup>TH</sup>) business day following the date of this Notice to Proceed**:

- a. Contractor's **preliminary schedule of construction**.
- b. Contractor's **preliminary schedule of values** for all of the Work.
- c. Contractor's **preliminary schedule of submittals**, including Shop Drawings, Product Data, and Samples submittals
- d. **Contractor's Safety Plan** specifically adapted for the Project.
- e. A **complete subcontractors list**, (including subcontractors under ½ of 1%) the name, address, telephone number, facsimile number, California State Contractors License number, classification, and monetary value of all Subcontracts.

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

COUNTY OF ALAMEDA

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

NAME: **Gerald K. Loeper**

TITLE: **Architect, Project Manager**

END OF DOCUMENT

DOCUMENT 00 56 00

## ESCROW OF BID DOCUMENTATION

### 1. Requirement to Escrow Bid Documentation

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

### 2. Ownership of Escrow Bid Documentation

- a. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by County, as provided herein.

- b. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of it reflecting Contractor's contemplated techniques of construction. Subject to the provisions herein, County agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

### 3. Format and Contents of Escrow Bid Documentation

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

### 4. Submittal of Escrow Bid Documentation

- a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container **within SEVEN (7) calendar days after the date of the Notice of Award**. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "Escrow Bid

Documentation – Intended to be opened in the presence of Authorized Representatives of Both County and Contractor".

- b. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.
- c. If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price **exceeds 5 percent of the total contract price** proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.
- d. If Contractor wishes to subcontract any portion of the Work after award, County retains the right to require Contractor to submit Escrow Documents for the Subcontractor before the subcontract is approved.

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

- a. The Escrow Bid Documentation will be placed in escrow, for the life of the Contract, in a mutually agreeable institution. The cost of storage will be paid by Contractor for the duration of the project until final Contract payment. The storage facilities shall be the appropriate size for all the Escrow Bid Documentation and located conveniently to both County's and Contractor's offices.
- b. The Escrow Bid Documentation shall be examined by both County and Contractor, at any time deemed necessary by either County or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. In the case of legal proceedings, Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:
  - (1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law.
  - (2) County and Contractor shall each designate, in writing to the other party **SEVEN (7) calendar days prior to any examination**, the names of representatives who are authorized to examine the Escrow Bid Documentation. No other person shall have access to the Escrow Bid Documentation.

- (3) Access to the documents may take place only in the presence of duly designated representatives of the County and Contractor. If Contractor fails to designate a representative or appear for joint examination **on SEVEN (7) calendar days notice**, then the County representative may examine the Escrow Bid Documents alone **upon an additional THREE (3) calendar days notice** if a representative of the Contractor does not appear at the time set.
  - (4) If a subcontractor has submitted sealed information to be included in the Escrow Bid Documents, access to those documents may take place only in the presence of a duly designated representative of the County, Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination **on SEVEN (7) calendar days notice**, then the County representative and/or the Contractor may examine the Escrow Bid Documentation without that subcontractor present **upon an additional THREE (3) calendar days notice** if a representative of that subcontractor does not appear at the time set.
- c. The Escrow Bid Documentation will be returned to Contractor at such time as the Contract has been completed and final settlement has been achieved.

END OF DOCUMENT

DOCUMENT 00 57 00

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

Public Contract Code Section 22300

This Escrow Agreement ("Escrow Agreement") is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2017, by and between County of Alameda, whose address is 1401 Lakeside Dr. #800, Oakland, California ("County"); and

\_\_\_\_\_, whose place of business is located at \_\_\_\_\_, ("Contractor"); and \_\_\_\_\_, a state or federally chartered bank in the state of California, whose place of business is located at \_\_\_\_\_, ("Escrow Agent").

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

1. Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by County pursuant to the Construction Contract No. \_\_\_\_\_ entered into between County and Contractor for the **Environmental Health Office Remodel**, in the amount of \_\_\_\_\_ dated, \_\_\_\_\_, 2017, (the "Contract"). Alternatively, on written request of Contractor, County 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 County **within ten (10) calendar days of the deposit**. The market value of the securities at the time of substitution and at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between County and Contractor.

Securities shall be held in name of County of Alameda, and shall designate Contractor as beneficial owner.

2. County shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified above.

3. When County makes payment of retention earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when County 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 County. These expenses and payment terms shall be determined by County, 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 County.
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 County to Escrow Agent that County consents to withdrawal of amount sought to be withdrawn by Contractor.
7. County shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in event of default by Contractor. **Upon seven (7) days written notice to Escrow Agent from County** of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by County.
8. Upon receipt of written notification from County certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.
9. Escrow Agent shall rely on written notifications from County and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and County and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.
10. Names of persons who are authorized to give written notice or to receive written notice on behalf of County and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:



**Alameda County General Services Agency  
Environmental Health Office Remodel**

**PROJECT #14028**

On behalf of County:

On behalf of Contractor:

Architect, Project Manager

Title

Gerald K. Loeper

Name

Signature

1401 Lakeside Dr. #800, Oakland, CA

Address

\_\_\_\_\_

Title

\_\_\_\_\_

Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Address

On behalf of Escrow Agent:

\_\_\_\_\_

Title

\_\_\_\_\_

Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Address

At the time of Escrow Account is opened, County and Contractor shall deliver to Escrow Agent a fully executed of this Agreement.

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

On behalf of County:

On behalf of Contractor:

Architect, Project Manager

Title

Gerald K. Loeper

Name

Signature

1401 Lakeside Dr. #800, Oakland, CA

Address

\_\_\_\_\_

Title

\_\_\_\_\_

Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Address

On behalf of Escrow Agent:

\_\_\_\_\_

Title

\_\_\_\_\_

Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Address

END OF DOCUMENT

ALAMEDA COUNTY GSA-CP

ESCROW AGREEMENT FOR  
SECURITY DEPOSITS IN LIEU OF RETENTION  
DOCUMENT 00 57 00

DOCUMENT 00 61 13.13

**PERFORMANCE BOND FORM**  
(100% of Contract Price)

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

KNOW ALL PERSONS BY THESE PRESENTS:

That WHEREAS, the Board of Supervisors of the County of Alameda ("County")  
and \_\_\_\_\_, ("Principal") have entered into a contract  
for the furnishing of all materials and labor, services and transportation, necessary,  
convenient, and proper to perform the following project:

**#14028 Environmental Health Office Remodel**  
("Project" or "Contract")

which Contract dated \_\_\_\_\_, 2017, and all of the Contract Documents  
attached to or forming a part of the Contract, are hereby referred to and made a part  
hereof, and

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

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

\_\_\_\_\_ DOLLARS (\$\_\_\_\_\_),  
lawful money of the United States, for the payment of which sum well and truly to be  
made we bind ourselves, our heirs, executors, administrators, successors, and assigns  
jointly and severally, firmly by these presents, to perform all the work required to  
complete the Project and to pay to County all damages County incurs as a result of the  
Principal's failure to perform all the Work required to complete the Project.

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

And the Surety, for value received, hereby stipulates and agrees that no change, extension  
of time, alteration, or addition to the terms of the contract or to the work to be performed

thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by

the Principal and Surety above named, on the \_\_\_\_ day of \_\_\_\_\_, 2017.

(Affix Corporate Seal)

\_\_\_\_\_  
Principal

\_\_\_\_\_  
By

\_\_\_\_\_  
Surety

\_\_\_\_\_  
By

\_\_\_\_\_  
Name of California Agent of Surety

\_\_\_\_\_  
Address of California Agent of Surety

\_\_\_\_\_  
Telephone Number of California Agent of  
Surety

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

END OF DOCUMENT

DOCUMENT 00 61 13.16

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

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

KNOW ALL PERSONS BY THESE PRESENTS:

That WHEREAS, the Board of Supervisors of the County of Alameda ("County") and \_\_\_\_\_, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to

**#14028 Environmental Health Office Remodel**  
("Project")

which Contract dated \_\_\_\_\_, **2017**, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to 100 percent (100%) of the Maximum Contract Value, to secure the claims to which reference is made in sections 9000, 9100, 9356 through 9560, and 9564 of the Civil Code of California, and division 2, part 7, of the Labor Code of California.

NOW, THEREFORE, WE, the Principal and \_\_\_\_\_, ("Surety") are held and firmly bound unto all laborers, material men, and other persons referred to in said

statutes in the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the Principal or any of his or its subcontractors, of the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, provender, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded

and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under sections 9000, 9100, 9356 through 9560, and 9564 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

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

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

IN WITNESS WHEREOF, **two (2) identical counterparts of this instrument**, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal

and Surety above named, on the \_\_\_\_\_ day of \_\_\_\_\_, 2017.

(Affix Corporate Seal)

\_\_\_\_\_  
Principal

\_\_\_\_\_  
By

\_\_\_\_\_  
Surety

\_\_\_\_\_  
By

\_\_\_\_\_  
Name of California Agent of Surety

\_\_\_\_\_  
Address of California Agent of Surety

\_\_\_\_\_  
Telephone Number of California Agent of Surety

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

END OF DOCUMENT

DOCUMENT 00 65 19.26

## FINAL SETTLEMENT CERTIFICATE FORM

THIS FINAL SETTLEMENT AGREEMENT AND RELEASE OF CLAIMS  
("Agreement and Release") IS MADE AND ENTERED INTO THIS \_\_\_\_\_ DAY  
OF \_\_\_\_\_, 2017 by and between the County of Alameda ("County") and

\_\_\_\_\_ ("Contractor"), whose place  
of business is \_\_\_\_\_.

### RECITALS:

1. County and Contractor entered into PROJECT NO.: 14028 ("Contract" or "Project") in the County of Alameda, California.
2. The Work under the Contract has been completed.

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

### AGREEMENT

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

Original Contract Sum	\$ _____
Modified Contract Sum	\$ _____
Payment to Date	\$ _____
Liquidated Damages	\$ _____
Payment Due Contractor	\$ _____
4. Subject to the provisions hereof, County shall forthwith pay to Contractor the undisputed sum of \$ \_\_\_\_\_ ( \_\_\_\_\_ Dollars and \_\_\_\_\_ Cents) under the Contract, less any amounts represented by any notice to withhold funds on file with County as of the date of such payment.
5. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against County arising from the performance of work under the Contract, except for the claims described in Paragraph 6 and continuing obligations described in Paragraph 8. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes

of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against County, all its respective agents, employees, inspectors, assignees and transferees except for the Disputed Claim is set forth in Paragraph 6 and continuing obligations described in Paragraph 8 hereof.

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

<u>Claim No.</u>	<u>Description of Claim</u>	<u>Amount of Claim</u>	<u>Date Claim Submitted</u>
------------------	-----------------------------	------------------------	-----------------------------

**[Insert information, including attachment if necessary]**

7. Consistent with California Public Contract Code section 7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 4 hereof, Contractor hereby releases and forever discharges County, all its agents, employees, inspectors, assignees, and transferees from any and all liability, claims, demands, actions, or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.
8. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.
9. To the furthest extent permitted by California law, Contractor shall defend, indemnify, and hold harmless the County, its agents, representatives, officers, consultants, employees, trustees, and volunteers (the "indemnified parties") from any and all losses, liabilities, claims, suits, and actions of any kind, nature, and description, including, but not limited to, attorneys' fees and costs, directly or indirectly arising out of, connected with, or resulting from the performance of the Contract unless caused wholly by the sole negligence or willful misconduct of the indemnified parties.
10. Contractor hereby waives the provisions of California Civil Code section 1542 which provides as follows:

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

11. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable. If any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal, or other law, ruling, or regulations, then such provision, or part thereof, shall remain in force and effect to the extent

permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

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

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

COUNTY OF ALAMEDA

TITLE: \_\_\_\_\_

NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

CONTRACTOR

TITLE: \_\_\_\_\_

NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

END OF DOCUMENT



DOCUMENT 00 65 36

**WARRANTY FORM**

\_\_\_\_\_ ("Contractor") hereby agrees that the  
\_\_\_\_\_ ("Work" of Contractor) which Contractor has installed for  
County of Alameda ("County") for the following project:

PROJECT: **#14028 Environmental Health Office Remodel**  
("Project" or "Contract")

has been performed in accordance with the requirements of the Contract Documents and that the  
Work as installed will fulfill the requirements of the Contract Documents.

The undersigned agrees to repair or replace any or all of such Work that may prove to be defective in  
workmanship or material together with any other adjacent Work that may be displaced in connection  
with such replacement **within a period of two year(s) from the date of completion** as defined in  
Public Contract Code section 7107, subdivision (c), ordinary wear and tear and unusual abuse or  
neglect excepted. The date of completion is \_\_\_\_\_, **2017**.

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

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

Proper Name of Contractor: \_\_\_\_\_

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

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

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

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

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NO.: \_\_\_\_\_

END OF DOCUMENT

SECTION 00 72 13

**GENERAL CONDITIONS**

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## GENERAL CONDITIONS

### 1. CONTRACT TERMS AND DEFINITIONS

#### 1.1 Definitions

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

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

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

**1.1.3 Architect:** The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect, who will have the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the County's Architect on this Project or the Architect's authorized representative.

**1.1.4 Architect's Supplemental Instruction:** A document prepared by the Architect to provide supplemental instructions or interpretations or to order minor changes in the work not involving adjustment in the Contract Amount or Contract Time.

**1.1.5 Bidder:** A contractor who intends to provide a bid to the County to perform the Work of this Contract.

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

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

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

**1.1.9 Construction Schedule:** The progress schedule of construction of the Project as provided by Contractor and approved by County.

**1.1.10 Contract, Contract Documents:** The Contract consists exclusively of the documents evidencing the agreement of the County and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

**1.1.10.1** Notice to Bidders

**1.1.10.2** Instructions to Bidders

**1.1.10.3** Supplementary Instructions to Bidders – Construction Outreach Program

- 1.1.10.4** Bid Form
- 1.1.10.5** Bid Security Form
- 1.1.10.6** Designated Subcontractors List
- 1.1.10.7** Site-Visit Certification, if a site visit was required.
- 1.1.10.8** Non-Collusion Affidavit
- 1.1.10.9** Workers' Compensation Certification
- 1.1.10.10** Prevailing Wage and Related Labor Requirements Certification
- 1.1.10.11** Construction Outreach Program Certifications
- 1.1.10.12** Hazardous Materials Certification
- 1.1.10.13** Imported Materials Certification
- 1.1.10.14** Notice of Award
- 1.1.10.15** Agreement
- 1.1.10.16** Notice to Proceed
- 1.1.10.17** Escrow of Bid Documentation
- 1.1.10.18** Escrow Agreement for Security Deposits in Lieu of Retention
- 1.1.10.19** Performance Bond
- 1.1.10.20** Payment Bond (Contractor's Labor & Material Payment Bond)
- 1.1.10.21** General Conditions
- 1.1.10.22** Special Conditions
- 1.1.10.23** Hazardous Materials Procedures and Requirements
- 1.1.10.24** Divisions 01 through 49
- 1.1.10.25** All Plans, Technical Specifications, and Drawings
- 1.1.10.26** Any and all addenda to any of the above documents
- 1.1.10.27** Any and all change orders or written modifications to the above documents if approved in writing by the County.

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

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

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

**1.1.14** County: County of Alameda, acting through its Board of Supervisors or any of its authorized agents. The County may, at any time:

**1.1.14.1** Direct the Contractor to communicate with or provide notice to the Construction Manager and/or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the County; and/or

**1.1.14.2** Direct the Construction Manager and/or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the County will communicate with or direct the Contractor.

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

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

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

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

**1.1.19** Premises: The real property owned by the County on which the Site is located.

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

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

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

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

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

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

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

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

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

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

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

**1.1.31** Site: The Project site as shown on the Drawings.

**1.1.32** Specifications: That portion of the Contract Documents, Division 01 through Division 49, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

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

**1.1.34** Submittal Schedule: The schedule of submittals as provided by Contractor and approved by County.

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

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

## **1.2 Laws Concerning The Contract**

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

## **1.3 No Oral Agreements**

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

#### 1.4 No Assignment

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

#### 1.5 Notice And Service Thereof

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

- 1.5.1.1** If notice is given by personal delivery thereof, it shall be considered delivered on the day of delivery.
- 1.5.1.2** If notice is given by overnight delivery service, it shall be considered delivered **one (1) day after date deposited**, as indicated by the delivery service.
- 1.5.1.3** If notice is given by depositing same in United States mail, enclosed in a sealed envelope, it shall be considered delivered **three (3) days after date deposited**, as indicated by the postmarked date.
- 1.5.1.4** If notice is given by registered or certified mail with postage prepaid, return receipt requested, it shall be considered delivered on the day the notice is signed for.

#### 1.6 No Waiver

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

#### 1.7 Substitutions For Specified Items

See Special Conditions.

#### 1.8 Materials and Work

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

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

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

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

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

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

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

**1.8.8** Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under any law permitting such protection or any rights under any law permitting such persons to look to funds due Contractor in hands of County (e.g., Stop



Notices), and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

**1.8.9** Title to new materials and/or equipment for the Work of this Contract and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by County. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work of this Contract. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to County or its authorized representative and shall, at the County's request, forward it to the County.

**2. COUNTY**

**2.1 Occupancy**

County reserves the right to occupy portions of the Project at any time before completion. Neither the County's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by County shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein.

**3. ARCHITECT**

**3.1 Role and Authority**

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

**3.2 Interpretations**

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

**3.3 Laws**

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

**3.4 Communications**

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

**4. CONSTRUCTION MANAGER**

**4.1 Role and Authority**

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

#### **4.2 Authority to Reject**

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

#### **4.3 If No Construction Manager**

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

### **5. INSPECTIONS AND TESTS**

#### **5.1 Tests and Inspections**

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

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

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

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

#### **5.2 Costs for After Hours and/or Off Site Inspections**



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

## 6. CONTRACTOR

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

### 6.1 Status of Contractor

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

**6.1.2** As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractor's State License Board, 3132 Bradshaw Road, Post Office Box 2600, Sacramento, California 98826, <http://www.cslb.ca.gov>.

### 6.2 Contractor's Supervision

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

**6.2.2** The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees. All workers shall be sufficiently competent in English to respond to inquiries and instructions and give directions concerning matters of safety and concerning the identification and location of site foremen, the Contractor's construction superintendent and the Contractor's project manager.

**6.2.3** Before commencing the Work herein, Contractor shall give written notice to County of the name and relevant credentials of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be changed except with prior written notice to County and County's approval, unless the Contractor's project manager and/or construction superintendent

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

**6.2.4** Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to County, Construction Manager, and Architect any error, inconsistency, or omission that Contractor or its employees and Subcontractors may discover, in writing. The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

### **6.3 Duty to Provide Fit Workers**

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

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

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

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

### **6.4 Purchase of Materials and Equipment**

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

### **6.5 Documents On Work Site**

**6.5.1** Contractor shall at all times keep on the Work Site, or such other location as County may authorize in writing one legible copy of all Contract Documents, including Addenda and Change Orders, and titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building Code, all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to County, Construction Manager, Architect, Architect's representatives, and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project. Contractor shall coordinate with Architect and Construction Manager.

**6.5.2** Daily Job Reports. Contractor shall maintain, at a minimum, **at least one (1) set of Daily Job Reports at the Project site.** These must be prepared by the

Contractor's employee(s) who are present on Site and must include, at a minimum, the following information:

- 6.5.2.1 A brief description of all Work performed on that day. This shall include a listing of what was done, which contractors were on site that day, and where on the site the work was performed.
- 6.5.2.2 A summary of all other pertinent events and/or occurrences on that day.
- 6.5.2.3 The weather conditions on that day.
- 6.5.2.4 A list of all Subcontractor(s) working on that day.
- 6.5.2.5 A list of each Contractor employee working on that day and the total hours worked for each employee.
- 6.5.2.6 A complete list of all equipment on Site that day, whether in use or not.
- 6.5.2.7 A complete list of all materials, supplies, and equipment delivered on that day.
- 6.5.2.8 A complete list of all inspections and tests performed on that day.
- 6.5.2.9 Each day Contractor shall provide a copy of the previous day's Daily Job Report to the County or the County's Construction Manager upon request.

## 6.6 Preservation of Records

The County shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to the County. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the County. The Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit or reproduction **until three (3) years after final payment** under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency if available, after the time set forth above.

## 6.7 Integration of Work

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

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

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

#### **6.8 Obtaining of Permits and Licenses**

Contractor shall secure and pay for all permits, licenses, and certificates necessary for prosecution of Work before the date of the commencement of the Work or before the permits, licenses, and certificates are legally required to continue the Work without interruption. The Contractor shall **obtain and pay, when legally required, for all licenses, permits, inspections, and inspection certificates required to be obtained from or issued by any authority having jurisdiction** over any part of the Work included in the Contract. All final permits, licenses, and certificates shall be delivered to County before demand is made for final payment.

#### **6.9 Work to Comply With Applicable Laws and Regulations**

**6.9.1** Contractor shall give all notices and comply with the following specific laws, ordinances, rules, and regulations and all other applicable laws, ordinances, rules, and regulations bearing on conduct of Work as indicated and specified, including but not limited to the appropriate statutes and administrative code sections. If Contractor observes that Drawings and Specifications are at variance therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that will result in finished Work being at variance therewith, Contractor shall promptly notify County in writing, including by e-mail, and any changes deemed necessary by County shall be made as provided in Contract for changes in Work.

- 6.9.1.1** National Electrical Safety Code, U. S. Department of Commerce
- 6.9.1.2** National Board of Fire Underwriters' Regulations
- 6.9.1.3** California Building Code, latest addition, and the California Code of Regulations, title 24, including amendments
- 6.9.1.4** Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America
- 6.9.1.5** Industrial Accident Commission's Safety Orders, State of California
- 6.9.1.6** Regulations of the State Fire Marshall (title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes
- 6.9.1.7** Americans with Disabilities Act
- 6.9.1.8** Government Code of the State of California
- 6.9.1.9** Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies
- 6.9.1.10** Public Contract Code of the State of California
- 6.9.1.11** California Art Preservation Act
- 6.9.1.12** U. S. Copyright Act

**6.9.1.13 U. S. Visual Artists Rights Act**

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

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

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

**6.10 Safety/Protection of Persons and Property**

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

**6.10.2** The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

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

**6.10.4** Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor.

**6.10.5** The Contractor shall furnish to the County a copy of the Contractor's safety plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

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

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

**6.10.8** Hazards Control – Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent the

accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

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

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

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

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

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

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

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

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

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



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

**6.10.19** Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to County.

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

#### **6.11 Working Evenings and Weekends**

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

#### **6.12 Badge Policy For Contractors**

All Contractors doing work for Alameda County will provide their workers with identification badges. These badges will be worn by all members of the Contractor's staff who are working in a County facility.

**6.12.1** Badges must be filled out in full and contain the following information:

- 6.12.1.1** Name of Contractor and Contractor's Company logo, if any
- 6.12.1.2** Name and front facial photograph of Employee
- 6.12.1.3** Contractor's address and phone number
- 6.12.1.4** Name and phone number of Project Manager (County)

**6.12.2** Badges are to be worn when the Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees that they are required to allow County employees to review the information on the badges upon request.

**6.12.3** Failure to display identification badges as required by this policy may result in the assessment of fines against the Contractor.

**6.13 County Drug Policy - Drug-Free Work Place**

**6.13.1** Contractor, Contractor's employees, and Contractor's Subcontractors and their employees shall comply with the County's policy of maintaining a drug-free workplace. Neither Contractor/Subcontractor nor Contractor's/Subcontractor's employees shall unlawfully manufacture, distribute, dispense, possess or use controlled substances, as defined in 21 U.S. Code Section 812, including alcohol, marijuana, heroin, cocaine, and amphetamines, at any County facility or work site. If Contractor or any employee of contractor is convicted or pleads nolo contendere to a criminal drug statute violation occurring at a County facility or work site, the Contractor **within five (5) calendar days thereafter** shall notify the head of the County department/agency for which the contract services are performed. Violation of this provision shall constitute a material breach of this contract.

**6.14 Cleaning Up**

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

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

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

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

**7. SUBCONTRACTORS**



**7.1 Contractor Shall Provide Subcontractor Information**

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

**7.2 No Contractual Relationship Between County and Subcontractors**

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

**7.3 Contractor Binds Every Subcontractor by Terms of Contract**

Contractor agrees to bind every Subcontractor by terms of Contract as far as those terms are applicable to Subcontractor's work. If Contractor shall subcontract any part of this Contract, Contractor shall be as fully responsible to County for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

**7.4 No Waiver of Obligations**

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

**7.5 Contractor to Familiarize Itself with Laws**

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

**7.6 Subcontractor Substitutions**

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

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

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

**7.6.3** Sublet or subcontract any portion of the Work in excess of one-half of one percent (1/2 of 1%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

### **7.7 Subcontractor Coordination**

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

### **7.8 Subcontractor Relations**

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

### **7.9 Assignment or Termination**

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

## **8. OTHER CONTRACTS/CONTRACTORS**

### **8.1 County Right to Perform**

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

### **8.2 Protection of Work**

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

### **8.3 Coordination with Other Work**

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

### **8.4 Measurement of Work Performed**

To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the County in writing, including by e-mail, any discrepancy between that executed work and the Contract Documents.

### **8.5 Knowledge of Other Work**

Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any County-performed work or other contracts that have been or may be awarded

by County in prosecution of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

#### **8.6 No Exclusive Occupancy of Site**

Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. Contractor shall not cause any unnecessary hindrance or delay to the use and/or operation(s) of the Premises and/or to County or any other contractor working on the Project. If simultaneous execution of any contract or operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the County of the resolution.

### **9. DRAWINGS AND SPECIFICATIONS**

#### **9.1 List of all Drawings**

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

#### **9.2 Technical and Trade Words**

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

#### **9.3 Trade Name or Trade Term**

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

#### **9.4 The Naming of any Material and/or Equipment Shall Mean Furnishing**

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

#### **9.5 Contract Documents are Complementary**

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

#### **9.6 Drawings and Specifications are Intended to Comply With All Laws**

Drawings and Specifications are intended to comply with all laws ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as

a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

#### **9.7 Plans, Drawings, Designs, Specifications are County Property**

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

#### **9.8 Order of Precedence**

In the case of discrepancy or ambiguity in the Contract Documents the order of precedence in the Agreement shall prevail.

#### **9.9 Resolution of Discrepancy or Ambiguity**

However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide County with the functionally complete and operable Project described in the Drawings and Specifications.

#### **9.10 County Clarification**

In case of ambiguity, conflict, or lack of information, County will furnish clarifications with reasonable promptness. Should any clarification, in the opinion of Contractor, cause an increase in the Contract Price, Contractor may request a change in the Contract Price and/or Contract. **Within seven (7) days after receipt of the interpretation or request**, Contractor to submit to the Construction Manager a detailed description of the contract requirements that were exceeded and the resulting change in cost.

### **10. CONTRACTOR'S SUBMITTALS AND SCHEDULES**

Refer to Section 01 33 00 "Submittal Requirements". Contractor's submittals shall comply with the provisions and requirements of the Specifications.

#### **10.1 Schedule of Work, Schedule of Submittals, and Schedule of Values**

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

##### **10.1.1 Preliminary Schedule**

A preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by County, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific

determination of the start and completion of each critical path task, float time for each task, as well as all contract milestones and each milestone's completion date(s) as may be required by the County. Upon acceptance by County of Construction Schedule, Contractor shall provide County Project Manager with poster size print(s) of agreed upon schedule.

#### **10.1.2 Preliminary Schedule of Values**

A preliminary schedule of values for all of the Work, which must include quantities and prices of items aggregating the Contract Price and must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. This preliminary schedule of values shall include, at a minimum, the following information, and the following structure:

##### **10.1.2.1** Divided into at least the following categories:

- 10.1.2.1.1** Overhead and profit;
- 10.1.2.1.2** Supervision;
- 10.1.2.1.3** General conditions;
- 10.1.2.1.4** Layout;
- 10.1.2.1.5** Mobilization;
- 10.1.2.1.6** Submittals;
- 10.1.2.1.7** Bonds and insurance;
- 10.1.2.1.8** Close-out documentation;
- 10.1.2.1.9** Demolition;
- 10.1.2.1.10** Installation;
- 10.1.2.1.11** Rough-in;
- 10.1.2.1.12** Finishes;
- 10.1.2.1.13** Testing;
- 10.1.2.1.14** Punch list and acceptance.

##### **10.1.2.2** Divided by each of the following areas:

- 10.1.2.2.1** Site work;
- 10.1.2.2.2** By each building;
- 10.1.2.2.3** By each floor.

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

- 10.1.3.1** Mobilization and layout combined to **equal not more than 1%**;
- 10.1.3.2** Submittals, samples and shop drawings combined to **equal not more than 3%**, bonds and insurance combined to **equal not more than 2%**.
- 10.1.3.3** Close-out documentation shall have a value in the preliminary schedule of **not less than 5%**.

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

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

**10.1.6** Once the preliminary schedule of values is approved by the County, this shall become the Schedule of Values. The Schedule of Values shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the County, which may be granted or withheld in the sole discretion of the County.

#### **10.1.7 Preliminary Schedule of Submittals**

A preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by County, this shall become the Submittal Schedule. All submittals shall be forwarded to the County by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the County so as not to delay the Construction Schedule.

#### **10.1.8 Safety Plan**

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

- 10.1.8.1** All applicable requirements of California Division of Industrial Safety ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").
- 10.1.8.2** All provisions regarding Project safety, including all applicable provisions of these General Conditions.
- 10.1.8.3** Contractor's Safety Plan shall be in English and in the language(s) of the Contractor's and its Subcontractors' employees.

#### **10.1.9 Complete Subcontractor List**

The name, address, telephone number, facsimile number, primary contact person's name, primary contact person's direct telephone number, primary contact person's e-mail address, California State Contractors License number, classification, and monetary value of all Subcontracts for parties furnishing labor, material, or equipment for completion of the Project.

#### **10.1.10 General Requirements**



- 10.1.10.1** Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the County.
- 10.1.10.2** The County will review the schedules submitted, and the Contractor shall make changes and corrections in the schedules as requested by the County and resubmit the schedules until approved by the County.
- 10.1.10.3** The County shall have the right at any time to revise the schedule of values if, in the County's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.
- 10.1.10.4** All submittals and schedules must be approved by the County before Contractor can rely on them as a basis for payment.

## **10.2 Monthly Progress Schedule(s)**

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

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

## **10.3 Material Safety Data Sheets (MSDS)**

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

# **11. SITE ACCESS, CONDITIONS, AND REQUIREMENTS**

## **11.1 Site Investigation**

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

## **11.2 Soils Investigation Report**

**11.2.1** When a soils investigation report obtained from test holes at Site is available, that report shall be available to the Contractor but shall not be a part of this

Contract. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a part of this Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it has made a visual examination of Site and has made whatever tests Contractor deems appropriate to determine underground condition of the soil.

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

### **11.3 Access to Work**

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

### **11.4 Layout and Field Engineering**

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

**11.4.2** The Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. County shall not be liable for any claim for allowances because of Contractor's error or negligence in acquainting itself with the conditions at the Site.

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

### **11.5 Utilities**

Utilities shall be provided as indicated in the Specifications.

### **11.6 Sanitary Facilities**

Sanitary facilities shall be provided as indicated in the Specifications.

### **11.7 Surveys**

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



## **11.8 Regional Notification Center**

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

## **11.9 Existing Utility Lines**

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

**11.9.2** Locations of existing utilities provided by County shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care nor costs of repair due to Contractor's failure to do so. County shall compensate Contractor for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment necessarily idle during such work.

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

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

## **11.10 Notification**

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the County pursuant to these provisions is to allow the County to investigate the condition(s) so that the County shall have the opportunity to decide how the County

desires to proceed as a result of the condition(s). Accordingly, failure of Contractor to promptly notify the County in writing, including by e-mail, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

#### **11.11 Hazardous Materials**

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

#### **11.12 No Signs**

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

### **12. TRENCHES**

#### **12.1 Trenches Greater Than Five Feet**

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

#### **12.2 Excavation Safety**

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

#### **12.3 No Tort Liability of County**

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

#### **12.4 No Excavation Without Permits**

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

#### **12.5 Discovery of Hazardous Waste and/or Unusual Conditions**

**12.5.1** Pursuant to Public Contract Code Section 7104, if the Work involves digging trenches or other excavations that **extend deeper than four feet below the Surface**, the Contractor shall promptly, and before the following conditions are disturbed, notify the County, in writing, including by e-mail, of any:

- 12.5.1.1 Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
- 12.5.1.2 Subsurface or latent physical conditions at the Site differing from those indicated.
- 12.5.1.3 Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

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

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

### 13. INSURANCE AND BONDS

#### 13.1 Insurance

All insurance required of Contractor and/or its Subcontractor(s) shall be in amounts set forth in the Special Conditions, and include the provisions as set forth herein.

##### 13.1.1 Commercial General Liability and Automobile Liability Insurance

13.1.1.1 Contractor shall procure and maintain, during the life of this Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect Contractor, County, Construction Manager(s), and Architect(s) from all claims for bodily injury, property damage, personal injury, death, advertising injury, and medical payments arising from operations under this Contract. Contractor shall ensure that Products Liability and Completed Operations coverage and Fire Damage Liability is included within the above policies and within the required limits, or Contractor shall procure and maintain these coverages separately.

13.1.1.2 Subcontractor: Contractor shall require its Subcontractors if any, to procure and maintain similar Commercial General Liability Insurance and Automobile Liability Insurance with minimum limits equal to the amount required of the Contractor. Contractor shall verify Subcontractor's compliance.

##### 13.1.2 Excess Liability Insurance

**13.1.2.1** Contractor shall procure and maintain, during the life of this Contract, Excess Liability Insurance that shall protect Contractor, County, Construction Manager(s), and Architect(s) in amounts and including the provisions as set forth in the Special Conditions, and that complies with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance.

**13.1.2.2** Subcontractor: Contractor shall require its Subcontractor(s) if any, to procure and maintain similar Excess Liability Insurance with minimum limits equal to the amount required of the Contractor. Contractor shall verify Subcontractor's compliance.

**13.1.3 Workers' Compensation and Employers' Liability Insurance**

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

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

**13.1.4 Builder's Risk Insurance: Builder's Risk "All-Risk" Insurance.**

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

**13.1.5 Proof of Carriage of Insurance and Other Requirements: Endorsements and Certificates.**

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

**13.1.5.2** Endorsements, certificates, and insurance policies shall include the following:

**13.1.5.2.1** A clause stating:

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

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

**13.1.5.3** All endorsements, certificates and insurance policies shall state that County, its Supervisors, employees, and agents, Construction Manager(s), and Architect(s) are named additional insureds under all policies except Workers’ Compensation Insurance and Employers’ Liability Insurance. Contractor’s and Subcontractors’ insurance policy(s) shall be primary and non-contribution to any insurance or self-insurance maintained by County, its Supervisors, employees and/or agents, Construction Manager(s), and/or Architect(s). All endorsements shall waive any right to subrogation against any of the named additional insureds.

**13.1.5.4** All policies shall be written on an occurrence form.

**13.2 Contract Security - Bonds**

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

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

**13.2.1.2 Payment Bond:** A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of

persons performing labor and/or furnishing materials in connection with this Contract.

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

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

#### **14. WARRANTY/GUARANTEE/INDEMNITY**

##### **14.1 Warranty/Guarantee**

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

**14.1.2** In addition to guarantees required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work furnished on the job against all defects **for a period of TWO (2) years** after the later of the following dates:

**14.1.2.1** The date of completion as defined in Public Contract Code Section 7107, subdivision (c),

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

**14.1.3** At the County's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within the warranty period specified in Section 00 65 36 Warranty Form, from date of completion as defined above without expense whatsoever to County. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs **within ten (10) days after being notified** in writing, including by e-mail, Contractor and Surety hereby acknowledge and agree that County is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand. Said **notice period shall be forty-eight (48) hours** for components essential to operation of the facility, including without limitation fire alarms, water, heat, security systems, and electrical systems.

**14.1.4** If, in the opinion of County, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to County or to prevent interruption of operations of County, County will attempt to give the notice required above. If Contractor or Surety cannot be contacted or does not comply with County's request for correction within a reasonable time as determined by County, County may, notwithstanding the above provision, proceed to make any and all corrections and/or provide attentions the County believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in this Contract.

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



**14.1.6** Nothing herein shall limit any other rights or remedies available to County.

## **14.2 Indemnity**

**14.2.1** To the fullest extent permitted by California law, the Contractor shall indemnify, defend with legal counsel reasonably acceptable to the County, keep and hold harmless the County and its consultants, the Architect and its consultants, the Construction Manager and its consultants, separate contractors, and their respective board members, officers, representatives, contractors, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, liabilities, damages, losses, and expenses caused by, arising out of, resulting from, or incidental to, the performance of the Work under this Contract by the Contractor or its Subcontractors to the full extent allowed by the laws of the State of California, and not to any extent that would render these provisions void or unenforceable, including, without limitation, any such suit, claim, damage, loss, or expense attributable to, without limitation, bodily injury, sickness, disease, death, alleged patent violation or copyright infringement, or to injury to or destruction of tangible property (including damage to the Work itself) including the loss of use resulting therefrom, except to the extent caused solely by the negligence, or willful misconduct of the Indemnitees. The County may participate in the defense of any such claim without relieving Contractor of any obligation hereunder. This agreement and obligation of the Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist as to any party or person described herein. This indemnification, defense, and hold harmless obligation includes any failure or alleged failure by Contractor to comply with any provision of law or the Contract Documents, including, without limitation, any stop notice actions, or liens by the California Department of Labor Standards Enforcement. This indemnity obligation shall be **for the full amount of all damage to County**, including defense costs, and shall not be limited by any insurance limits.

**14.2.2** The Contractor shall give prompt notice to the County in the event of any injury (including death), loss or damage included herein. Without limitation of the provisions herein, if the Contractor's agreement to indemnify, defend, and hold harmless the Indemnitees as provided herein against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of any of the Indemnitees shall to any extent be, or be determined to be, void or unenforceable, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of the Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein, and in the case of any such suits, claims, damages, losses, or expenses caused in part by the default, negligence, or act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, and in part by any of the Indemnitees, the Contractor shall be and remain fully liable on its agreements and obligations herein to the full extent permitted by law.

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

any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

**14.2.4** Contractor shall place in its Subcontractor agreements and cause its Subcontractors to agree to indemnities and insurance obligations in favor of County and other Indemnities in the exact form and substance of those contained in these General Conditions (00 72 13). Contractor shall require all Subcontractors to comply with all indemnification and insurance requirements of this agreement. Contractor shall verify Subcontractor's compliance.

## **15. TIME**

### **15.1 Notice to Proceed**

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

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

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

### **15.2 Computation of Time / Adverse Weather**

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

- 15.2.1.1** The weather conditions constitute Adverse Weather, as defined herein and further specified in the Special Conditions;
- 15.2.1.2** Contractor can verify that the Adverse Weather caused delays **in excess of seventy-five percent (75%) for at least five hours**, of the normal labor and equipment force toward completion of the day's current controlling item(s) on the latest accepted schedule;
- 15.2.1.3** The Contractor's crew is dismissed as a result of the Adverse Weather; and



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

**15.2.2** A day-for-day extension will only be allowed for those days in excess of those indicated in the Special Conditions. Weather delay time extensions to the contract period will be non-compensable.

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

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

### **15.3 Hours of Work**

#### **15.3.1 Sufficient Forces**

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

#### **15.3.2 Performance During Working Hours**

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

### **15.4 Progress and Completion**

#### **15.4.1 Time of the Essence**

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

#### **15.4.2 No Commencement Without Insurance**

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

### **15.5 Expeditionary Completion**

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

## **16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES**

### **16.1 Liquidated Damages**

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

## **16.2 Excusable Delay**

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

**16.2.2** Contractor shall notify the County pursuant to the claims provisions in these General Conditions of any anticipated delay and its cause. Following submission of a claim, the County may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the Work might be delayed thereby.

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

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

**16.2.3.2** Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay.

**16.2.3.3** A recovery schedule must be submitted.

## **16.3 No Additional Compensation for Delays Within Contractor's Control**

**16.3.1** Contractor is aware that governmental agencies, including, without limitation, the Department of General Services, gas companies, electrical utility companies, water companies, and other agencies may have to approve Contractor-prepared drawings or

approve a proposed installation. Accordingly, Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Thus, Contractor is not entitled to make a claim for damages or delays arising from the review of Contractor's service applications and drawings.

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

- 16.3.2.1** The County is responsible for the delay;
- 16.3.2.2** The delay is unreasonable under the circumstances involved;
- 16.3.2.3** The delay was not within the contemplation of County and Contractor; and
- 16.3.2.4** Contractor complies with the claims procedure of the Contract Documents.

#### **16.4 Float or Slack in the Schedule**

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

### **17. CHANGES IN THE WORK**

#### **17.1 No Changes Without Authorization**

**17.1.1** There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order or a written Construction Change Directive authorized by the County as herein provided. County shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the County's governing board has authorized the same and the cost thereof has been approved in writing by Change Order or Construction Change Directive. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order or Construction Change Directive. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

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

**17.1.3** Should any Change Order result in an increase in the Contract Price, the cost of that Change Order shall be agreed to, in writing, in advance by Contractor and County and be subject to the monetary limitations set forth in Public Contract Code Section 20137. In the event that Contractor proceeds with any change in Work without a Change Order executed by the County or Construction Change Directive, Contractor waives any claim for additional compensation or time for that additional work.

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

**17.2 Architect Authority to Order Minor Changes**

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

**17.3 Change Orders**

**17.3.1** A Change Order is a written instrument prepared and issued by the County and/or the Architect and signed by the County (as authorized by the County's Board of Supervisors), the Contractor, and the Architect, stating their agreement regarding all of the following:

**17.3.1.1** A description of a change in the Work;

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

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

**17.4 Construction Change Directives**

**17.4.1** A Construction Change Directive is a written order prepared and issued by the County, the Construction Manager, and/or the Architect and signed by the County and the Architect, directing a change in the Work. The County may as provided by law, by Construction Change Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. Any dispute as to the sum of the Construction Change Directive or timing of payment shall be resolved pursuant to the Payment and Claims and Disputes provisions herein.

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

**17.5 Force Account Directives**

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

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

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

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

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

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

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

## **17.6 Price Request**

### **17.6.1 Definition of Price Request**

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

### **17.6.2 Scope of Price Request**

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

## **17.7 Proposed Change Order**

### **17.7.1 Definition of Proposed Change Order**

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

### 17.7.2 Changes in Contract Price

A PCO shall include breakdowns pursuant to the revisions herein to validate any change in Contract Price.

### 17.7.3 Changes in Time

A PCO shall also include any changes in time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the critical path within the approved Construction Schedule as defined in the Contract Documents. If Contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting time and/or claiming a delay.

### 17.7.4 Unknown and/or Unforeseen Conditions

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

## 17.8 Format for Proposed Change

**17.8.1** The following format shall be used as applicable by the County and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation. **In no case shall the Contractor's total mark-up exceed 26.5%.**

	<u>SUBCONTRACTOR PERFORMED WORK</u>	<u>ADD</u>	<u>DEDUCT</u>
a)	<u>Material</u> (attach itemized quantity and unit cost plus sales tax)		
b)	<u>Add Labor</u> (attach itemized hours and rates, fully encumbered)		
c)	<u>Add Equipment</u> (attach suppliers' invoice)		
d)	<u>Subtotal</u>		
e)	<u>Add Subcontractor's overhead and profit</u> , not to exceed ten percent (10%) of item (d)		
f)	<u>Subtotal</u>		
g)	<u>Add Contractor's overhead and profit</u> , not to exceed ten percent (10%) of Item (f)		
h)	<u>Subtotal</u>		
i)	<u>Add Bond and Insurance</u> , not to exceed one percent (1%) of Item (h)		



j)	<u>TOTAL</u>		
k)	<u>Time</u>	<u>Days</u>	
	<u>CONTRACTOR PERFORMED WORK</u>	<u>ADD</u>	<u>DEDUCT</u>
a)	<u>Material</u> (attach itemized quantity and unit cost plus sales tax)		
b)	<u>Add Labor</u> (attach itemized hours and rates, fully encumbered)		
c)	<u>Add Equipment</u> (attach suppliers' invoice)		
d)	<u>Subtotal</u>		
e)	<u>Add Contractor's overhead and profit</u> , not to exceed ten percent (10%) of item (d)		
f)	<u>Subtotal</u>		
g)	<u>Add Bond and Insurance</u> , not to exceed one percent (1%) of Item (f)		
h)	<u>TOTAL</u>		
i)	<u>Time</u>	<u>Days</u>	

## 17.9 Change Order Certification

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

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

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

**17.10 Determination of Change Order Cost**

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

- 17.10.1** County acceptance of a PCO;
- 17.10.2** By unit prices contained in Contractor's original bid;
- 17.10.3** By agreement between County and Contractor.

**17.11 Allowable Costs**

Allowable costs for any change order shall be limited to the following:

**17.11.1** Costs of labor, including social security, Medicare, and unemployment insurance, fringe benefits required workers' compensation insurance.

**17.11.2** Costs of first line supervision labor, including labor burden as described in paragraph 1. "First-Line Supervision" shall mean a working foreman or lead craft worker other than the project superintendent;

**17.11.3** Actual costs of the project superintendent associated with any period of compensable delay caused by issuance of the change order. In the absence of a compensable delay, all of the project superintendent's time is considered to have been paid for as part of the overhead;

**17.11.4** Actual costs of materials, including sales tax and delivery;

**17.11.5** Rental costs of machinery and equipment, exclusive of small tools, whether rented from the Contractor or others. For Contractor and Subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule. For rental equipment, payment will be made based on actual rental invoices. 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;

**17.11.6** Overhead and Profit as specified below. "Overhead" shall include the following:

**17.11.6.1** Preparation of all paperwork related to changes in the Work, including field review, estimating and cost breakdown; coordination and supervision, both office and field, including the project superintendent; vehicles including has and maintenance; small tools, incidentals and consumables; engineering, detailing, and revisions to shop drawings and as-built drawings; general office expense; extended and unabsorbed home office overhead; warranty, all taxes; and all other expenses not specifically described in items 17.11.1 through 17.11.5.

**17.11.6.2** The actual costs of insurance premiums required by this contract and associated with the change order work will be reimbursed by the County.

**17.11.7** Upon receipt of a PCO/Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction



Manager **within seven (7) calendar days of the Contractor's agreement** or disagreement with the method, if any, provided in the PCO/Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**17.11.8** Failure to respond to and return a PCO/Change Directive to the County **within (7) days** indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

#### **17.12 Deductive Change Orders**

All deductive Change Order(s) must be prepared pursuant to the provisions herein. If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a **minimum of five percent (5%) total profit and overhead** to be deducted with the amount of the work of the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a **minimum of five percent (5%) profit and overhead to be deducted** with the amount of its deducted work. Any deviation from this provision shall not be allowed.

#### **17.13 Discounts, Rebates, and Refunds**

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

#### **17.14 Accounting Records**

With respect to portions of the Work performed by Change Orders and Construction Change Directives, the Contractor shall keep and maintain cost-accounting records satisfactory to the County, which shall be available to the County on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents.

#### **17.15 Notice Required**

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

#### **17.16 Applicability to Subcontractors**

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

#### **17.17 Alteration to Change Order Language**

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

**17.18 Failure of Contractor to Execute Change Order**

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

**18. REQUEST FOR INFORMATION**

**18.1** The Contractor shall coordinate the Work so that dimensions are verified, and clarifications that may affect the work are identified to allow for resolution without delaying the Work. The Contractor is responsible to submit a Request for Information as soon as the issue requiring clarification is identified. The Contractor shall be responsible for any delay in the construction progress due to any untimely submission of a Request for Information for A/E's review. Non-receipt of a Request for Information, or proceeding with Work pertaining to the Request for Information shall be construed as relieving the County of any Claim for added cost or extension of time.

**18.2 Reference Contract Documents**

Any Request for Information shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. The Contractor shall make suggestions and interpretations of the issue raised by each Request for Information. A Request for Information cannot modify the Contract Price, Contract Time, or the Contract Documents.

**18.3 Contractor Responsible For Costs**

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

**19. PAYMENTS**

**19.1 Contract Price**

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

**19.2 Applications for Progress Payments**

**19.2.1 Procedures for Applications for Progress Payments**

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

**19.2.1.1.1** The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

**19.2.1.1.2** The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

**19.2.1.1.3** The balance that will be due to each of such entities after said payment is made;

**19.2.1.1.4** A certification that the Record Drawings and annotated Specifications are current;

**19.2.1.1.5** Itemized breakdown of work done for the purpose of requesting partial payment;

**19.2.1.1.6** An updated and acceptable construction schedule in conformance with Section 10.1 above;

**19.2.1.1.7** The additions to and subtractions from the Contract Price and Contract Time;

**19.2.1.1.8** A total of the retentions held;

**19.2.1.1.9** Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the County may require from time to time;

**19.2.1.1.10** The percentage of completion of the Contractor's Work by line item;

**19.2.1.1.11** Schedule of Values updated from the preceding Application for Payment;

**19.2.1.1.12** A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code Section 3262 from the Contractor and each subcontractor of any tier and supplier to be paid from the current progress payment;

**19.2.1.1.13** A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code Section 3262 from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payment; and

**19.2.1.1.14** A certification by the Contractor of the following:

The Contractor warrants title to all Work performed as of the date of this payment application. The Contractor further warrants that all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons or entities making a claim by reason of having

provided labor, materials, and equipment relating to the Work, except those of which the County has been informed.

**19.2.2** The Contractor shall be subject to the False Claims Act set forth under Government Code Section 12650 et seq., for information provided with any Application for Progress Payment.

**19.2.3 Prerequisites for Progress Payments**

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

**19.2.3.1.1** Installation of the Project sign;

**19.2.3.1.2** Installation of field office;

**19.2.3.1.3** Installation of temporary facilities and fencing;

**19.2.3.1.4** Schedule of Values;

**19.2.3.1.5** Contractor's Construction Schedule in conformance with Section 10.1.1.1 above;

**19.2.3.1.6** Schedule of unit prices, if applicable;

**19.2.3.1.7** Submittal Schedule;

**19.2.3.1.8** Receipt by Architect of all submittals due as of the date of the payment application;

**19.2.3.1.9** Copies of necessary permits;

**19.2.3.1.10** Copies of authorizations and licenses from governing authorities;

**19.2.3.1.11** Initial progress report;

**19.2.3.1.12** Surveyor qualifications;

**19.2.3.1.13** Written acceptance of County's survey of rough grading, if applicable;

**19.2.3.1.14** List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

**19.2.3.1.15** All bonds and insurance endorsements;

**19.2.3.1.16** Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent; and

**19.2.3.1.17** Safety plan.

**19.2.3.2** Second Payment Request. The County will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect, and Contractor's Schedule has been accepted as in compliance with Section 10.1.1.1 above.

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

**19.3 Progress Payments**

**19.3.1 County's Approval of Application for Payment**

- 19.3.1.1** Upon receipt of an Application for Payment, the County shall act in accordance with both of the following:

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

**19.3.1.1.2** Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but **not later than seven (7) calendar days, after receipt**. An Application for Payment returned pursuant to this paragraph shall be accompanied by a document setting forth in writing, including by e-mail, the reasons why the Application for Payment is not proper. The number of days available to the County to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the County exceeds this seven-day return requirement.

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

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

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

**19.3.1.2.2** Results of subsequent tests and inspections,

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

**19.3.1.2.4** Specific qualifications expressed by the Architect.

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

**19.3.2 Payments to Contractor**

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

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

**19.3.2.3** If the County fails to make any progress payment **within thirty (30) days after receipt** of an undisputed and properly submitted Application for Payment by the Contractor, the County shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

**19.3.3 No Waiver**

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

**19.3.4 Removal of Liens**

**19.3.4.1** If a lien or a claim based on a stop notice of any nature should at any time be filed against the Work or any County property, by any entity that has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by County and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or a claim based on a stop notice to be released or discharged immediately therefrom.

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



suffered by County from any sum payable to Contractor under the Contract.

**19.4 Decisions to Withhold Payment**

**19.4.1 Reasons to Withhold Payment**

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

- 19.4.1.1** Defective Work not remedied within the time frames noted in Section 14 hereof of written notice to Contractor;
- 19.4.1.2** Stop Notices, or other liens served upon the County as a result of the Contract;
- 19.4.1.3** Liquidated damages assessed against the Contractor;
- 19.4.1.4** The cost of completion of the Contract, if there exists reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the completion date;
- 19.4.1.5** Damage to the County or other contractor(s);
- 19.4.1.6** Unsatisfactory prosecution of the Work by the Contractor;
- 19.4.1.7** Failure to store and properly secure materials;
- 19.4.1.8** Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, Monthly Progress Schedules, Shop Drawings, Product Data and samples, Proposed product lists, executed Change Orders, and/or properly completed Elation updates;
- 19.4.1.9** Failure of the Contractor to maintain Record Drawings;
- 19.4.1.10** Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;
- 19.4.1.11** Unauthorized deviations from the Contract Documents;
- 19.4.1.12** Failure of the Contractor to prosecute the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates;
- 19.4.1.13** Failure to properly pay prevailing wages as defined in Labor Code section 1720 et seq., and/or failure to comply with any other Labor Code requirements,
- 19.4.1.14** Failure to properly maintain or clean-up the Site;
- 19.4.1.15** Payments to indemnify, defend, or hold harmless the County;

- 19.4.1.16 Any payments due to the County, including but not limited to payments for failed tests, utility changes or permits;
- 19.4.1.17 Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents;
- 19.4.1.18 Contractor is otherwise in breach, default, or in substantial violation of any provision of this Contract.

#### 19.4.2 Reallocation of Withheld Amounts

- 19.4.2.1 County may, at its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, County shall make such payments on behalf of Contractor. If any payment is so made by County, then that amount shall be considered a payment made under Contract by County to Contractor and County shall not be liable to Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. County will render Contractor an accounting of funds disbursed on behalf of Contractor.
- 19.4.2.2 If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, County may, **after FORTY-EIGHT (48) hours written notice to the Contractor** and, without prejudice to any other remedy, make good such deficiencies. The County shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If County deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of **at least one hundred twenty-five percent (125%) of the estimated reasonable value of the nonconforming Work**) shall be made therefor.

#### 19.4.3 Payment After Cure

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

### 19.5 Subcontractor Payments

#### 19.5.1 Payments to Subcontractors

**No later than ten (10) days after payment receipt**, or pursuant to Business and Professions Code Section 7108.5 and Public Contract Code Section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

#### 19.5.2 No Obligation of County for Subcontractor Payment



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

### **19.5.3 Joint Checks**

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

## **20. COMPLETION OF THE WORK**

### **20.1 Completion**

**20.1.1** County will accept completion of the Contract and have the Notice of Completion recorded when the entire Work, including the final Commissioning Report if applicable, shall have been completed to the satisfaction of County.

**20.1.2** The Work may only be accepted as complete by action of the County Board of Supervisors.

**20.1.3** County, at its sole option, may accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of County, except for minor corrective items, as distinguished from incomplete items. If Contractor fails to complete all minor corrective items **within thirty (30) days after the date of the County's acceptance of completion**, County shall withhold from the final payment **one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items**, as determined by County, until the item(s) are completed.

**20.1.4** **At the end of the thirty-five (35) day period**, if there are any items remaining to be corrected, County may elect to proceed as provided herein related to adjustments to Contract Price, and/or County's right to perform the Work of the Contractor.

### **20.2 Close-Out Procedures**

#### **20.2.1 Punch List**

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

#### **20.2.2 Close-Out Requirements**

##### **20.2.2.1 Utility Connections**

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

**20.2.2.2 Record Drawings**

- 20.2.2.2.1** Contractor shall provide exact “as-built” Record Drawings of the Work upon completion of the Project as indicated in the Specifications.
- 20.2.2.2.2** Contractor is liable and responsible for any and all inaccuracies in as-built Record Drawings, even if inaccuracies become evident at a future date.
- 20.2.2.2.3** Upon completion of the Work and as a condition precedent to approval of final payment, Contractor shall obtain the Architect’s approval of the corrected prints and employ a competent draftsman to transfer the “as-built” information to the most current version of Autocad that is, at that time, currently utilized for plan check submission by either the County, the Construction Manager and/or the Architect, and submit electronic files. When completed, Contractor shall deliver corrected electronic files acceptable to County with Autocad file to the County.
- 20.2.2.2.4** Maintenance Manuals: Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

**20.3 Final Inspection**

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

**20.3.2** Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the County and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify Contractor, who shall then jointly submit to the Architect and the County its final Application for Payment.

**20.3.3 Final Inspection Requirements**

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

- 20.3.3.1** The Work has been completed.
- 20.3.3.2** All life-safety items are completed and in working order.

- 20.3.3.3** Mechanical and electrical Work are complete and tested, fixtures are in place, connected, and ready for tryout.
- 20.3.3.4** Electrical circuits scheduled in panels and disconnect switches labeled.
- 20.3.3.5** Painting and special finishes complete.
- 20.3.3.6** Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.
- 20.3.3.7** Tops and bottoms of doors sealed.
- 20.3.3.8** Floors waxed and polished as specified.
- 20.3.3.9** Broken glass replaced and glass cleaned.
- 20.3.3.10** Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.
- 20.3.3.11** Work cleaned, free of stains, scratches, and other foreign matter, of damaged and broken material replaced.
- 20.3.3.12** Finished and decorative work shall have marks, dirt, and superfluous labels removed.
- 20.3.3.13** Final clean-up, as provided herein.

#### **20.4 Costs of Multiple Inspections**

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

#### **20.5 Partial Occupancy or Use Prior to Completion**

##### **20.5.1 County's Rights**

The County may occupy or use any completed or partially completed portion of the Work at any stage. The County and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. Any dispute as to responsibilities shall be resolved pursuant to the Claims and Disputes provisions herein, with the added provision that during the dispute process, the County shall have the right to occupy or use any portion of the Work that it needs or desires to use.

##### **20.5.2 Inspection Prior to Occupancy or Use**

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

##### **20.5.3 No Waiver**

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

## **21. FINAL PAYMENT AND RETENTION**

### **21.1 Final Payment**

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

### **21.2 Prerequisites for Final Payment**

The following conditions must be fulfilled prior to Final Payment:

**21.2.1** A full and final waiver or release of all Stop Notices in connection with the Work shall be submitted by Contractor, including a release of Stop Notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all Stop Notice rights.

**21.2.1.1** A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 3262 from the Contractor and each subcontractor of any tier and supplier to be paid from the current progress payment;

**21.2.1.2** A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 3262 from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payment; and

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

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

**21.2.3** Contractor must have completed all requirements set forth under "Close-Out Procedures", including, without limitation, an approved set of complete "as-built" Record Drawings.

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

**21.2.5** The Contractor shall have delivered to the County all manuals and materials required by the Contract Documents.

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

**21.3 Retention**

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

**21.3.1.1** After approval of the County by the Architect's Certificate of Payment,

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

**21.3.1.3** **After thirty-five (35) days after the recording of the Notice of Completion** by County.

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

**21.4 Substitution of Securities**

The County will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

**22. UNCOVERING OF WORK**

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

If a portion of the Work has been covered, which the Project Inspector or the Architect has not specifically requested to observe prior to its being covered, the County, Project Inspector, or the Architect may request to see that Work, and it shall be uncovered by the Contractor. If that Work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order, be charged to the County. If that Work is not in accordance with Contract Documents, the Contractor shall pay these costs unless the condition was caused by the County or a separate contractor, in which event the County shall be responsible for payment of such costs to the Contractor.

**23. NONCONFORMING WORK, CORRECTION OF WORK AND COUNTY'S RIGHT TO PERFORM WORK**

**23.1 Nonconforming Work**

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

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

## **23.2 Correction of Work**

### **23.2.1 Correction of Rejected Work**

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

### **23.2.2 Warranty Corrections**

If, within the warranty period specified in 00 65 36 Warranty Form, after the date of Completion of the Work or a designated portion thereof, or after the date of commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the County to do so. This **period of two (2) years shall be extended with respect to portions of the Work** first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive acceptance of the Work under the Contract and termination of the Contract. The County shall give such notice promptly after discovery of the condition.

## **23.3 County's Right to Perform Work**

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

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

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

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



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

## 24. TERMINATION AND SUSPENSION

### 24.1 County's Right to Terminate Contractor for Cause

#### 24.1.1 Grounds for Termination.

The County, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon the following:

- 24.1.1.1 Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or
- 24.1.1.2 Contractor fails to complete said Work within the time specified or any extension thereof, or
- 24.1.1.3 Contractor persistently fails or refused to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or
- 24.1.1.4 Contractor files a petition for relief as a debtor, or a petition is filed against the Contractor without its consent, and the **petition not dismissed within sixty (60) days**; or
- 24.1.1.5 Contractor makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or
- 24.1.1.6 Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or
- 24.1.1.7 Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or
- 24.1.1.8 Contractor persistently disregards laws or ordinances, or instructions of County; or
- 24.1.1.9 Contractor fails to supply labor, including that of Subcontractors, that can work in harmony with all other elements of labor employed or to be employed on the Work; or
- 24.1.1.10 Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract.

**24.1.2 Notification of Termination**

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

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

**24.1.2.2.1 Within three (3) days after service** upon it of the notice of tender, gives County written notice of Surety's intention to take over and perform this Contract; and

**24.1.2.2.2 Commences performance of this Contract within three (3) days from the date of serving** of its notice to County.

**24.1.2.3** If Surety fails to notify County or begin performance as indicated herein, County may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to County for any excess cost or other damages the County incurs thereby. Time is of the essence in this Contract. If the County takes over the Work as herein provided, County may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

**24.1.3 Effect of Termination**

**24.1.3.1** Contractor shall, only if ordered to do so by the County, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The County retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The Contractor and its Surety shall be liable upon the performance bond for all damages caused the County by reason of the Contractor's failure to complete the Contract.



- 24.1.3.2** In the event that the County shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the County shall not be liable nor account to the Contractor in any way for the time within which, or the manner in which, the Work is performed by the County or for any changes the County may make in the Work or for the money expended by the County in satisfying claims and/or suits and/or other obligations in connection with the Work.
- 24.1.3.3** In the event, that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor.
- 24.1.3.4** If the expense to the County to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay the difference to County **within twenty-one (21) days of County's request.**
- 24.1.3.5** The County shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the County, no Subcontractor shall have any claim against the County or third party for Work performed by Subcontractor or other matters arising prior to termination of the Contract. The County or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the County so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the County may require, for the purpose of fully vesting in the County the rights and benefits of it Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the County for expenses and damages suffered by the County as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.
- 24.1.3.6** The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to County.

## **24.2 Termination of Contractor for Convenience**

**24.2.1** County in its sole discretion may terminate the Contract **upon three (3) days written notice to the Contractor.** Under a termination for convenience, the County retains the right to all the options available to the County if there is a termination for cause. In case of a termination for convenience, the Contractor shall have no claims against the County except:

- 24.2.1.1** The actual cost of labor, materials, and services performed that is unpaid and can be documented through timesheets, invoices, receipts, or otherwise, and

**24.2.1.2**      **Five percent (5%) of the total cost of work performed** as of the date of termination, or five percent (5%) of the value of the Work yet to be performed, whichever is less. This five percent (5%) amount shall be full compensation for all Contractor's and its Subcontractor(s)' mobilization and/or demobilization costs and any anticipated loss profits resulting from termination of the Contractor for convenience.

**24.3      Emergency Termination of Public Contracts Act of 1949**

**24.3.1**      This Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

**24.3.1.1**      Section 4410 of the Government Code states:

In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the public agency and the contractor may, by written agreement, terminate said contract.

**24.3.1.2**      Section 4411 of the Government Code states:

Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party shall pay to the other or any other person, under the facts and circumstances in the case.

**24.3.1.3**      Compensation to the Contractor shall be determined at the sole discretion of County on the basis of the reasonable value of the Work done, including preparatory work. As an exception to the foregoing and at the County's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted schedule of values, that price shall control. The County, at its sole discretion, may adopt the Contract Price as the reasonable value of the work done or any portion thereof.

**25.      CLAIMS AND DISPUTES**

**25.1      Performance During Claim Process**

The Contractor shall continue to perform its Work under the Contract and shall not cause a delay in the Work during any dispute, claims definition, negotiation, mediation, or arbitration proceeding, except by written agreement by the County.

**25.2      Definition of Claim**

**25.2.1**      For purposes of this section, a claim means a separate demand by the Contractor for:

**25.2.1.1**      A time extension,

**25.2.1.2** Payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or

**25.2.1.3** Payment of money that the County disputes is owing.

### **25.3 Claim Presentations**

**25.3.1** If Contractor intends to claim an increase in the Contract Price or Contract Time for any reason including, without limitation, the acts of County or its agents, Contractor shall, **within ten (10) days after the event** giving rise to the claim, give notice of the claim in writing and submit to the County a written statement of the damage sustained or time requested. **On or before twenty (20) days after Contractor's written notice of claim**, Contractor shall file with the County an itemized statement of the details and amounts of its claim for any increase in the Contract Price of Contract Time. Contractor must timely submit the Notice of Claim and the substantiating documentation for any claim. Otherwise, Contractor shall have waived and relinquished its claim against the County and Contractor's claims for compensation or an extension of time shall be forfeited and invalidated, and Contractor shall not be entitled to consideration for payment or time on account of the instant matter.

**25.3.2** The attention of the Contractor is drawn to Government Code Section 12650, et seq. regarding penalties for false claims.

**25.3.3** Contractor shall file with the County any written claim, including the documents necessary to substantiate it, **on or before the day of final payment** on the Contract.

**25.3.4** The Contractor shall not cause a delay in the Work during any dispute, claims definition, negotiation, mediation, or arbitration proceeding, except by written agreement by the County.

**25.3.5** The Contractor shall bind all its Subcontractors, material persons, and suppliers to the provisions of this section on mediation and arbitration and will hold the County harmless against disputes and claims by Subcontractors, material persons, or suppliers.

### **25.4 Claim Resolution**

**25.4.1** In the event of a dispute between the parties as to performance of the Work, the interpretation of this Contract, or payment or nonpayment for Work performed or not performed, the parties shall attempt to resolve the dispute by those procedures set forth in Public Contract Code Section 20104, if applicable. Pending resolution of the dispute, if the dispute is not resolved, Contractor agrees it will neither rescind the Contract nor stop the progress of the Work, but will allow determination by a court of the State of California having competent jurisdiction of the dispute, after the Project has been completed, and not before.

#### **25.4.2 Public Works Claims of \$375,000 or Less**

**25.4.2.1** For all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a Contractor and a

local agency, the procedure set forth in Public Contract Code Section 20104 et seq. shall apply:

**25.4.2.1.1** For claims of less than fifty thousand dollars (\$50,000), the County shall respond in writing **within forty-five (45) days of receipt of the claim** or may request in writing **within thirty (30) days of receipt of the claim** any additional documentation supporting the claim or relating to defenses or claims the County may have against the claimant.

**25.4.2.1.1.1** If additional information is required, it shall be requested and provided by mutual agreement of the parties.

**25.4.2.1.1.2** The County's written response to the documented claim shall be submitted to the claimant **within fifteen (15) days after receipt of the further documentation** or within a period of time no greater than that taken by the claimant to produce the additional information, whichever is greater.

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

**25.4.2.1.2.1** If additional information is required, it shall be requested and provided upon mutual agreement of the County and the claimant.

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

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

- 25.4.2.3** Following the meet and confer conference, if the claim or any portion of it remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions the running of the time within which a claim must be filed shall be tolled from the time the claimant submits its written claim until the time the claim is denied, including any period of time utilized by the meet and confer process.
- 25.4.2.4** For any civil action filed to resolve claims filed pursuant to this section, **within sixty (60) days, but no earlier than thirty (30) days**, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection **within fifteen (15) days by both parties** of a disinterested third person as mediator, shall be commenced **within thirty (30) days of the submittal**, and shall be **concluded within fifteen (15) days** from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator **within the 15-day period**, any party may petition the court to appoint the mediator.
- 25.4.2.5** If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of the Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986, (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.
- 25.4.2.6** The County shall not fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the Contract Documents. In any suit filed pursuant to this section, the County shall pay interest at the legal rate on any arbitration award or judgment. Interest shall begin to accrue on the date the suit is filed in a court of law.
- 25.4.3 Public Works Claims Over \$375,000**
- 25.4.3.1** For all claims of over three hundred seventy-five thousand dollars (\$375,000) which arise between a Contractor and the County, the following procedure shall apply:
- 25.4.3.1.1** The parties agree to first endeavor to settle the dispute in an amicable manner by mediation under the Construction Industry Mediation Rules of the American Arbitration Association before having recourse to arbitration or a judicial forum. The claim or dispute shall be identified in writing to the County **within thirty (30)**

**days of discovery** and shall be **mediated within one hundred and twenty (120) days of discovery.**

**25.4.3.2** The parties further agree that all Contractors, Subcontractors, Sub-subcontractors, suppliers, and material persons whose **portion of the Work amounts to five thousand dollars (\$5,000) or more**, and their insurers and their sureties, shall agree to mediation as the first method of dispute resolution on all claims **in excess of three hundred seventy-five thousand dollars (\$375,000).**

## **26. LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS**

**26.1 Wage Rates, Travel, and Subsistence** – (For Projects over \$1M see also PROJECT STABILIZATION/ COMMUNITY BENEFITS AGREEMENT of the COUNTY OF ALAMEDA Document 00 73 49).

**26.1.1** Pursuant to the provisions of Article 2 (commencing with Section 1770), chapter 1, part 7, division 2, of the Labor Code of California, the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed to execute this Contract is on file at the County's principal office and copies will be made available to any interested party on request. Contractor shall obtain and post a copy of these wage rates at the job site.

**26.1.2** Holiday and overtime work, when permitted by law, shall be paid for at a rate of **at least one and one-half times the above specified rate of per diem wages**, unless otherwise specified. The holidays upon which those rates shall be paid need not be specified by the County but shall be all holidays recognized in the applicable collective bargaining agreement. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code.

**26.1.3** Contractor shall pay and shall cause to be paid each worker engaged in Work on the Project **not less than the general prevailing rate of per diem wages** determined by the Director of the Department of Industrial Relations ("DIR") ("Director"), regardless of any contractual relationship which may be alleged to exist between Contractor or any Subcontractor and such workers.

**26.1.4** Contractor shall pay and shall cause to be paid to each worker needed to execute the Work on the Project travel and subsistence payments, as such travel and subsistence payments are defined in the applicable Collective Bargaining Agreements filed with the Department of Industrial Relations in accordance with Labor Code Section 1773 et seq.

**26.1.5** If during the period this bid is required to remain open, the Director determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the Contract is to be performed, such change shall not alter the wage rates in the Notice to Bidders or the Contract subsequently awarded.

**26.1.6** Pursuant to Labor Code Section 1775, Contractor shall, as a penalty to County, forfeit the statutory amount for each calendar day, or portion thereof, for each worker paid less than the prevailing rates, determined by the County and/or the Director, for the work or craft in which that worker is employed for any public work done under



Contract by Contractor or by any Subcontractor under it. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate, shall be paid to each worker by Contractor.

**26.1.7** Any worker employed to perform Work on the Project, which Work is not covered by any classification listed in the general prevailing wage rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by him, and such minimum wage rate shall be retroactive to time of initial employment of such person in such classification.

**26.1.8** Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by section 3093, and similar purposes.

**26.1.9** Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions if any, from unpaid wages, actually earned. In addition, Contractor shall post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

**26.1.10** Contractor stipulates that it shall comply with all requirements of PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT (**for projects over \$1M**) of the COUNTY OF ALAMEDA, and shall pay to persons performing labor in and about the Work provided for in the Contract an amount equal to or more than the following:

**26.1.10.1** Wage rate and fringe benefit payments and classification for that person's corresponding labor classification as required by the Department of Industrial Relations;

**26.1.10.2** Wage rate and fringe benefit payments and classification for that person's corresponding labor classification as required under the PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT of the COUNTY OF ALAMEDA (**for projects over \$1M**) and California Labor Code.

**26.1.11** If there are conflicts between the Wage rate and fringe benefit payments and classification between the Department of Industrial Relations and the PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT of the COUNTY OF ALAMEDA (**for projects over \$1M**), Contractor shall pay the higher wage rate and fringe benefits.

## **26.2 Hours of Work**

**26.2.1** As provided in Article 3 (commencing with Section 1810), chapter 1, part 7, division 2, of the Labor Code, **eight (8) hours of labor shall constitute a legal days work**. The time of service of any worker employed at any time by Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by Contractor to



eight (8) hours per day, and **forty (40) hours during any one week**, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked **in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.**

**26.2.2** Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of County and to the Division of Labor Standards Enforcement of the DIR.

**26.2.3** Pursuant to Labor Code Section 1813, Contractor shall as a penalty to the County forfeit the statutory amount for each worker employed in the execution of this Contract by Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work **more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week** in violation of the provisions of Article 3 (commencing with Section 1810), chapter 1, part 7, division 2, of the Labor Code.

**26.2.4** Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the County.

### **26.3 Payroll Records**

**26.3.1** County will use the Alameda County Contract Compliance System, including the Elation Systems, Inc. program, to monitor contract and labor compliance. Contractor shall use the Compliance System to meet County's requirements, and shall participate in training as directed by County in order to become and remain competent in the use of the Compliance System.

**26.3.2** Pursuant to the provisions of section 1776 of the Labor Code, notice is hereby given that Contractor shall prepare and provide to the County and shall cause each Subcontractor performing any portion of the Work under this Contract to prepare and provide to the County an accurate and certified payroll record ("CPR(s)"), showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work.

**26.3.3** The CPRs enumerated hereunder shall be certified and shall be provided to the County on a weekly basis. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. County shall not make any payment to Contractor until:

**26.3.3.1** Contractor and/or its Subcontractor(s) provide CPRs acceptable to the County, and

**26.3.3.2** The County is given sufficient time to review and/or audit the CPRs to determine their acceptability. Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the County in a timely manner will directly delay the County's review and/or audit of the CPRs and Contractor's payment.

**26.3.4** All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

**26.3.4.1** A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

**26.3.4.2** CPRs shall be made available for inspection or furnished upon request to a representative of County, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the Department of Industrial Relations.

**26.3.4.3** CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the County, Division of Apprenticeship Standards or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall, prior to being provided the records reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

**26.3.5** The form of certification for the CPRs shall be as follows:

I, (Name-Print), the undersigned, am the (Position in business) with the authority to act for and on behalf of (Name of business and/or Contractor), certify under penalty of perjury that the records or copies thereof submitted and consisting of (Description, number of pages) are the originals or true, full, and correct copies of the originals which depict the payroll record(s) of actual disbursements by way of cash, check, or whatever form to the individual or individual named, and (b) we have complied with the requirements of sections 1771, 1811, and 1815 for any work performed by our employees on the Project.

Date: Signature:

(Section 16401 of the California Code of Regulations)

**26.3.6** Each Contractor shall file a certified copy of the CPRs with the entity that requested the records **within ten (10) days after receipt of a written request.**

**26.3.7** Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by County, Division of Apprenticeship Standards, or Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded Contract or performing Contract shall not be marked or obliterated.

**26.3.8** Contractor shall inform County of the location of the records enumerated hereunder, including the street address, city, and county, and shall, **within five (5) working days**, provide a notice of change of location and address.

**26.3.9** In the event of noncompliance with the requirements of this section, Contractor shall have **ten (10) days in which to comply** subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident **after the ten (10) day period**, Contractor shall, as a penalty to County, **forfeit twenty-five dollars (\$25) for each calendar day**, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of Division of Apprenticeship Standards or Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

**26.3.10** It shall be the responsibility of Contractor to ensure compliance with the provisions of Labor Code section 1776.

#### **26.4 Apprentices**

**26.4.1** Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

**26.4.2** Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

**26.4.3** Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only in the work of the craft or trade to which she/he is registered.

**26.4.4** Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she is training.

**26.4.5** Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprentice able craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

**26.4.6** Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

**26.4.7** If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

**26.4.7.1** Be denied the right to bid on any subsequent project **for one (1) year from the date of such determination;**

**26.4.7.2** Forfeit as a penalty to County the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

**26.4.8** Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

**26.4.9** Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to Sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California 94102.

## **26.5 Non-Discrimination**

**26.5.1** Contractor herein agrees not to discriminate in its recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, national origin, ancestry, sex, age, sexual orientation or physical handicap in the performance of this Contract and to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246, and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

**26.5.2** Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

## **26.6 Labor First Aid**

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) and the California Occupational Safety and Health Act of 1973 (8 Cal. Code of Regs., §1 et seq.).

## **27. MISCELLANEOUS**

### **27.1 Assignment of Antitrust Actions**

**27.1.1** Section 7103.5(b) of the Public Contract Code states:

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, made

and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

**27.1.2** Section 4552 of the Government Code states:

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

**27.1.3** Section 4553 of the Government Code states:

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

**27.1.4** Section 4554 of the Government Code states:

Upon demand in writing by the assignor, the assignee shall, **within one year from such demand**, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

**27.1.5** Under this Article, “public purchasing body” is County and “bidder” is Contractor.

**27.2 Excise Taxes**

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, County, upon request, will execute documents necessary to show (1) that County is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of County. No Federal Excise Tax for such materials shall be included in any Contract Price.

**27.3 Taxes**

**Contract Price is to include any and all applicable sales taxes or other taxes** that may be due in accordance with section 7051 of the Revenue and Taxation Code; Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

**27.4 Shipments**

All shipments must be F.O.B. destination to Site or sites, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

**END OF DOCUMENT**

DOCUMENT 00 73 13

## SPECIAL CONDITIONS

### 1. Mitigation Measures

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

### 2. Substitution for Specified Items

2.2. Requests for substitutions after award of the Contract shall be **within THIRTY-FIVE (35) days of the date of the Notice of Award.**

2.3. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal". Contractor may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified.

2.3.1. If the material, process, or article offered by Contractor is not, in the opinion of the County, substantially equal or better in every respect to that specified, then Contractor shall furnish the material, process, or article specified in the Specifications without any additional compensation or change order.

2.3.2. This provision shall not be applicable with respect to any material, product, thing or service for which County made findings and gave notice in accordance with Public Contract Code section 3400(b); therefore, Contractor shall not be entitled to request a substitution with respect to those materials, products or services.

2.4. A request for a substitution shall be in writing and shall include:

2.4.1. All variations of the proposed substitute from the material specified including, but not limited to, principles of operation, materials, or construction finish, thickness or gauge of materials, dimensions, weight, and tolerances;

2.4.2. Available maintenance, repair or replacement services;

2.4.3. Increases or decreases in operating, maintenance, repair, replacement, and spare parts costs;



- 2.4.4. Whether or not acceptance of the substitute will require other changes in the Work (or in work performed by the County or others under Contract with the County); and
- 2.4.5. The time impact on any part of the Work resulting directly or indirectly from acceptance of the proposed substitute.
- 2.5. No substitutions shall be made until approved, in writing, by the County. The burden of proof as to equality of any material, process, or article shall rest with Contractor. The Contractor warrants that if substitutes are approved:
  - 2.5.1. The proposed substitute is equal or superior in all respects to that specified, and that such proposed substitute is suitable and fit for the intended purpose and will perform adequately the function and achieve the results called for by the general design and the Contract Documents;
  - 2.5.2. The Contractor provides the same warranties and guarantees for the substitute that would be provided for that specified;
  - 2.5.3. The Contractor shall be fully responsible for the installation of the substitute and any changes in the Work required, either directly or indirectly, because of the acceptance of such substitute, **with no increase in Contract Price or Contract Time**. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time;
  - 2.5.4. The Contractor shall be responsible for any re-design costs occasioned by County's acceptance and/or approval of any substitute; and
  - 2.5.5. The Contractor shall, in the event that a substitute is less costly than that specified, credit the County with **one hundred percent (100%) of the net difference between the substitute and the originally specified material**. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit.
- 2.6. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- 2.7. In no event shall the County be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

3. **Weather Days**

- 3.1 Delays due to adverse weather conditions will only be permitted in compliance with the provisions in the General Conditions and only if the number of days of adverse weather exceeds the following parameters and only if Contractor can verify that adverse weather caused delays exceeded the following number of days:

January	11	July	0
February	10	August	0
March	10	September	1
April	6	October	4
May	3	November	7
June	1	December	10

4. **Insurance Policy Limits.** All of Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than A: XI.

The limits of insurance shall not be less than:

<b>Commercial General Liability</b>	Each Occurrence	<b>\$2,000,000</b>
	General Aggregate	<b>\$2,000,000</b>
	Product Liability and Completed Operations	<b>\$1,000,000</b>
<b>Automobile Liability – Any Auto</b>	Combined Single Limit	<b>\$2,000,000</b>
<b>Excess Liability</b>		<b>\$4,000,000</b>
<b>Workers Compensation</b>		Statutory limits pursuant to state law
<b>Employers' Liability</b>		<b>\$1,000,000</b>
<b>Builders Risk (Course of Construction)</b>		Issued for the value of the Contract

5. **Permits, Certificates, Licenses, Fees, Approval**

- 5.1 **Payment for Permits, Certificates, Licenses, and Fees.** As required in the General Conditions, the Contractor shall secure and pay for all permits, licenses and certificates necessary for the prosecution of the Work with the exception of the following:

2.7.1. Water connection fees

2.7.2. Sewer connection fees

With respect to the above listed items, Contractor shall be responsible for securing such items, however, County will be responsible for payment of these charges or fees. Contractor shall notify the County of the amount due with respect to such items and to whom the amount is payable. Contractor shall provide the County with an invoice and receipt with respect to such charges or fees.

**6. Work Restrictions**

Hours of Work: 7am to 4pm Monday through Friday, except holidays. After hours, weekend and holiday work requires written approval from County in advance.

Access to Site: Via main building entrance.

END OF DOCUMENT

DOCUMENT 00 73 49

**PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT  
of the  
COUNTY OF ALAMEDA  
and  
California Prevailing Wage  
Requirements**

**1. Summary**

1.1. In addition to Labor, Wage & Hour, Apprentice, and related provisions described in Document 00 72 13 Paragraph 26; the Work performed pursuant to this Contract, is subject to the requirements of the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA" ("PSCBA"). The Contractor agrees to be party to and bound by the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA". Contractor agrees to execute the "PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA Letter of Assent" and shall require all of its subcontractors, of whatever tier, to become similarly bound for all work within the scope of this Contract by signing an identical Letter of Assent.

**2. PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT Of the  
COUNTY OF ALAMEDA**

2.1. The PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA (PSCBA) is included for reference only in PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT for the COUNTY OF ALAMEDA Document 00 73 49B.

**2.1.1. ROLES AND RESPONSIBILITIES SUBCONTRACTS**

2.1.1.1. Each Contractor, which includes all subcontractors of any tier, including trucking entities performing Covered Work of this Contract, agrees that neither it nor any of its subcontractors will subcontract any Work of this Contract except to a person, firm, or corporation who is or becomes party to the PSCBA by signing the Letter of Assent attached to the PSCBA as Exhibit "A". All Contractors performing Covered Work of this Contract shall, as a condition to performing Work of this Contract, become Signatory to and perform all work under the terms of the PSCBA.

2.1.1.2. Each Contractor, which includes all subcontractors of any tier performing Work of this Contract, shall give written notice to the Union(s) of any subcontract involving the performance of work covered by the PSCBA

**within either five (5) business days** of executing a contract with such subcontract or before the subcontractor commences work on the Project, whichever occurs first. Such notice shall specify the name and address of the subcontractor, the California State License Board license number of the Contractors and scope of work to be performed. Written notice at a Pre-Job Conference shall be deemed written notice under this provision only for those subcontractors listed at the Pre-Job Conference

- 2.1.1.3. The Contractor shall be responsible for PSCBA compliance by all subcontractor and lower tier subcontractor.

## **2.1.2. WORK ASSIGNMENTS AND JURISDICTIONAL DISPUTES**

- 2.1.2.1. The assignment of the Work to subcontractors is solely the responsibility of the Contractor.
- 2.1.2.2. Each Contractor shall conduct a Pre-Job Conference with the Building and Construction Trades Council of Alameda County (Council) prior to commencing Work as specified in Paragraph 2.1.3 of this Document 00 73 49. The Contractor will notify the County in advance of all such conferences.
- 2.1.2.3. Any jurisdictional disputes regarding the assignment of the Work of this Contract will be resolved per the requirements of the PSCBA.

## **2.1.3. PRE-JOB CONFERENCE**

- 2.1.3.1. A mandatory Pre-Job Conference and/or Mark-Up Meeting will be held prior to the commencement of work to establish the scope of work in each Contractor and Subcontractor contract. All meeting shall be held at the offices of the Alameda County Building and Construction Trades Council.
- 2.1.3.2. The Contractor performing the work shall have the responsibility for making work assignments in accordance with the PSCBA, and will be required to bring relevant plans, specifications, and prints to the meeting, as requested by the Union.
- 2.1.3.3. Contractor must submit written workforce projections at the Pre-Job Conference. The workforce projections shall include projected man-hours on a craft-by-craft basis, consistent with the Contractor's bid proposal.
- 2.1.3.4. The County will schedule and attend all Pre-Job and Mark-Up Meetings and participate in discussions as they pertain to the terms and conditions of the PSCBA.

2.1.4. JOINT ADMINISTRATIVE COMMITTEE MEETINGS

- 2.1.4.1. The Joint Administrative Committee (JAC) has been established to monitor compliance with the PSCBA. The JAC meets monthly and reviews monthly reporting by the Contractor.
- 2.1.4.2. The Contractors shall provide progress report as described in Paragraph 2.1.8 of this Document.

2.1.5. COORDINATOR

- 2.1.5.1. The County will designate a Coordinator, who will be responsible for the administration and application of the PSCBA.

2.1.6. LOCAL HIRING PROGRAM

- 2.1.6.1. The Contractor agrees to achieve the inclusion of Residents as defined in the PSCBA in the employment and apprenticeship opportunities created by the Work of this Contract, which will be known as the Local Hiring Program (LHP) as described in the PSCBA.
- 2.1.6.2. The Contractor agrees to a goal that Residents of the County **will perform forty percent (40%) of all hours worked on the Work of this Contract**, on a craft-by-craft basis, if such workers are available, capable and willing to work on the projects, together with the apprentice goals described in Paragraph 2.1.7 of this Document.
- 2.1.6.3. The Contractors and subcontractors shall make good faith efforts to reach these goals, as described in the PSCBA including but not limited to the following:
  - 2.1.6.3.1. **Within one week of the issuance of the Notice to Proceed**, the Contractors shall meet with the County to review and approve its compliance plan for reaching the Local Hiring Goals, using the required compliance plan form provided by the County.
  - 2.1.6.3.2. Submit copies of hiring hall dispatch requests and responses to the County **within ten (10) days of County's request** at any point during the execution of the Work of this Contract.
  - 2.1.6.3.3. Immediately contact the County if a union hiring hall dispatcher will not or cannot, upon request of the Contractor, dispatch local residents.

- 2.1.6.3.4. Use the “Name Call,” “Rehire” or other available hiring hall procedures to reach goals and shall provide documentation of such requests to the County upon request.
- 2.1.6.3.5. Use community based organizations as a resource for local labor resources, if a union will not or cannot provide local Residents as requested
- 2.1.6.3.6. Sponsor local Residents for apprenticeship, when possible.
- 2.1.6.3.7. Maintain records for each Resident of Alameda County who was referred but not hired along with an explanation why the worker was not hired.
- 2.1.6.3.8. Document participation in any local employment training programs and submit documentation of such to the **County within ten (10) days if requested by County.**
- 2.1.6.3.9. To the extent possible, the parties agree to implement the Local Hiring Program while complying with the County’s Local Vendor Preference and Enhanced Construction Outreach (ECOP) programs for the work of this Contract. To the extent that the County determines, in its sole discretion, that there is a conflict between the Local Hiring Program established in the PSCBA and the County’s SLEB, ECOP, and/or Local Vendor Preference Programs, the conflict shall be resolved in favor of the Local Hiring Program of the PSCBA.
- 2.1.6.3.10. For the purpose of reaching the goal established in Paragraph 2.1.6.2 of this Document, a Contractor may qualify for full credit toward the goal by employing Alameda County Residents for other work the Contractor is performing in any of the nine Bay Area counties of: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Marin, Solano, Napa and Sonoma as outlined in the PSCBA.

#### 2.1.7. APPRENTICES

- 2.1.7.1. Although the PSCBA states that the County shall make available to the Unions a database of apprentices qualifying under the local hiring provision of the PSCBA, the County has not developed this database. Contractor is to contact the Unions for available apprentices.
  - 2.1.7.1.1. For each Covered Project, the Contractors will be responsible to ensure that it and/or its subcontractors hire **at least one (1) new apprentice for the first \$1 million of construction value and for each**



**succeeding \$5 million of construction contract value**, the Contractors and/or their subcontractors will be required to hire **at least one (1) additional new apprentice**. All such apprentices may be graduates of pre apprenticeship programs with known and successful track record of apprentice placement into jobs. All the pre apprenticeship program graduates must be Residents of Alameda County and members of a Disadvantaged Population, as described in the PSCBA.

2.1.7.2. Contractors shall exercise their best efforts to recruit apprenticeship program applicants from Residents and who are members of a Disadvantaged Population as described in the PSCBA.

2.1.7.3. The Contractor shall request dispatch of apprentices in writing from the local Unions and/or Joint Apprenticeship Training Committee in which the Contractor participates. Copies of the written requests shall be provided to the County **within ten (10) days of request by the Coordinator**.

2.1.7.4. For the purposes of meeting the goal established in Paragraph 2.1.6.1 of this Document, a Contractor may qualify for full credit toward the goal by employing Alameda County Residents as apprentices for other work the Contractor is performing in any of the nine Bay Area counties of: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Marin, Solano, Napa and Sonoma as described in the PSCBA.

## 2.1.8. DATA COLLECTION AND REPORTING

2.1.8.1. This Paragraph describes Contractor and data collection, reporting guidelines and responsibilities for the PSCBA.

2.1.8.2. On a monthly basis, Contractors must submit reports to the County on the status and progress of local hiring on a craft-by-craft basis, including utilization of apprentices as described in Document 00 73 49A "PSCBA Forms".

## 2.1.9. HELMETS TO HARDHATS: VETERAN EMPLOYMENT

2.1.9.1. The Contractor agrees to utilize the series of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and Center's "Helmets to Hardhats" program to serve as a resources for preliminary orientations, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as described in the PSCBA.

- 2.1.9.2. The Contractors may also utilize the services of the “Swords to Ploughshares” program.

3. **California Labor Code:** In addition to complying with the PSCBA, Contractor shall also comply with the California Labor Code prevailing wage requirements.

- 3.1. Pursuant to Labor Code Section 1770, *et seq.*, the Contractor shall pay to persons performing labor in and about the Work provided for in the Contract an amount equal to or more 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 legal holiday and overtime work in said locality, which per diem wages shall be equal to or more than the stipulated rates contained in a schedule thereof which has been ascertained and determined by the Director of the 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. The Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.
- 3.2. The Contractor shall forfeit, as a penalty to the County, **fifty dollars (\$50.00) for each laborer, workman, or mechanic employed** in performing labor in and about the work provided in the Contract Documents **for each day, or portion thereof, on which such laborer, workman or mechanic is paid less than the said stipulated rates** for any work done under these Contract Documents by him or her or by any Subcontractor or designer under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the Labor Code. The sums and amounts which shall be forfeited pursuant to this paragraph 3.2 and the terms of the Labor Code shall be withheld and retained from payments due or to become due to the Contractor under this Contract and the terms of 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 the County. The final amount of forfeiture shall be determined by the Labor Commissioner pursuant to Labor Code § 1775.
- 3.3. The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of work or labor on the Work provided for in the Contract Documents, a provision that the 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 as provided in the Labor Code.
- 3.4. The Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation Labor Code § 1813.

4. **Project Stabilization/Community Benefits Agreement/ Labor Compliance Program Monitoring.**

- 4.1. The County has elected to retain the services of a third party to monitor compliance with the PSCBA and California Labor Code Requirement.
- 4.2. The PSCBA/Labor Compliance Program (“PSCBA/LCP”) will enforce PSCBA, prevailing wage, apprentice employment and local hiring requirements consistent with California Labor Code and the PSCBA. PSCBA/LCP services do not limit the scope of Work and do not relieve the Contractor of any responsibility for coordination of the Work with California Labor Code or the PSCBA.
- 4.3. The Contractor shall be responsible for any costs that the County incurs as the result of any actions taken by DIR, or by the County when exercising its enforcement duties, to address Contractor and/or Subcontractor violations related to California Labor Code or the PSCBA. If the Contractor or any of its Subcontractor are notified that they should take certain actions to be in compliance with the PSCBA or applicable state law and those actions are not taken or not taken in a timely manner, then the County shall have the right to recover the cost of all work performed by or for the County or its contractors from the date of such notice and the County shall have the right to back charge the Contractor for any and all costs associated with such work.
- 4.4. Certified payroll reports for the duration of the Project shall be maintained by the Contractor and submitted electronically, and are subject to all of the following conditions:
  - 4.4.1. Certified Payroll Reports (CPR) shall be submitted to the County electronically on the web-based software system, described in Document 00 45 46.01 “Prevailing Wage and Related Labor Requirements Certification”, to be utilized for collection and verification of payroll reports for the Project.
  - 4.4.2. CPR must contain all of information required by California Labor Code section 1776 and must be organized in a manner that is similar or identical to the format in which the information is reported on the DIR “Public Works Payroll Reporting Form” (Form A-1-131);
  - 4.4.3. Statement of Compliance. CPR shall be accompanied by a signed “Statement of Compliance” certifying that the payroll reports are correct and complete and that each laborer or mechanic has been paid not less than the proper prevailing wage rate for the work performed. The wording of the certification shall comply with California Labor Code section 1776 and 29 C.F.R. § 5.5(a)(3)(ii)(B)-(D).
  - 4.4.4. Electronic CPR submitted to the County, the DIR Division of Labor Standards Enforcement (DLSE), or other entity within the DIR, must be in the form of a non-modifiable image or record that bears an electronic signature or includes a copy of any original certification made on paper. Printed reports submitted on paper with an original signature will be accepted as supplemental information to electronic reports, and will not relieve the Contractor or its Subcontractor from their obligation to submit electronic reports.

- 4.4.5. Apprenticeship Program. Reference is made to General Conditions Document 00 72 13, Paragraph 26 and the PSCBA for the Contractor and its Subcontractors obligation to comply, and be responsible for ensuring compliance, with the requirements of the California Labor Code provisions concerning the employment of apprentices, including Labor Code sections 1776, 1777.5, and 1777.6.

END OF DOCUMENT



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**1630 12<sup>th</sup> Street**  
**Oakland, CA 94607**  
[www.davillier-sloan.com](http://www.davillier-sloan.com)

## Labor Compliance Program Guidebook

Please provide this packet to all subcontractors with instruction that they provide it to all lower tier subcontractors. The Design-Build contractor is ultimately responsible for labor compliance on the entire project.

### Labor Compliance

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(510) 385-1261  
[emilija@davilliersloan.com](mailto:emilija@davilliersloan.com)

### Labor Compliance

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### Labor Compliance

Shanika Ratcliff  
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### Certified Payroll

Elation Systems, Inc.  
(925) 924 - 0340  
[support@elationsystems.com](mailto:support@elationsystems.com)

The information in this Guidebook is for general guidance on the matters of Labor Compliance monitoring. Davillier-Sloan, Inc. makes every attempt to ensure the information contained in the Guidebook is free from errors and obtained from accurate and current sources. Davillier-Sloan, Inc. reserves the right, at its discretion, to change or modify all or any part of this packet. Periodically revised updated copies may be obtained by emailing a request to: [info@davillier-sloan.com](mailto:info@davillier-sloan.com)

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**DAVILLIER-SLOAN, INC.**  
**LABOR MANAGEMENT CONSULTANTS**

## **Section 1: Introduction**

- A. Overview
- B. Prevailing Wage Determinations
- C. Site Visits
- D. Required Forms
- E. Project/Program Closeout
- F. Apprenticeship Utilization



## **Overview**

Davillier-Sloan, Inc. (DSI) is a third party Labor Compliance Program (LCP) administrator. This LCP Guidebook has been developed for your reference and highlights the requirements, submittals and timelines necessary to be compliant with the program.

Certified Payrolls for this project will be submitted electronically into the Elation web based program. Related forms will be available online and should be accessed and downloaded according to the instructions provided by Elation Systems once you have registered on the site.

The law requires that all workers including employees, independent contractors, owner-operators etc. on a public works project must be paid the prevailing wage of the area in which the project is located. Detailed information pertaining to labor compliance may be found in the contract specifications.

## **Prevailing Wage Determinations**

The California prevailing wage determinations are based on the first bid advertisement/publication date. For design build projects, the construction contract signing/construction contract award date shall be considered the bid advertisement date.

The California prevailing wage determinations and rates are published twice each year, in February and August. All determinations are effective ten (10) days after issuance. Some trades are issued regionally (Northern and Southern California) and other sub trades are by the county in which the project is located. There are separate determinations for apprentices on public works.

The prevailing wage determination by craft can be found on the Department of Industrial Relations (DIR) web site: [www.dir.ca.gov](http://www.dir.ca.gov) (Labor Law/Public Works). Prevailing wage determinations and any rate changes must be posted at the job site available for workers to view.

Asterisk (\*) clarifications:

- i Prevailing wage determinations with a single asterisk (\*) after the expiration date, which are in effect on the date of advertisement of bids, remain in effect for the life of the project.
- i Interested parties should contact the DIR at (415) 703-4774 for the new rates after ten (10) days from the expiration date (if no subsequent determination is required).
- i Prevailing wage determinations with double asterisks (\*\*) after the expiration date indicate that the basic hourly rate, overtime, holiday pay and employers' payments for work performed after this date have been predetermined. If work is to extend past this date, the new rates must be paid and should be incorporated into contracts entered now.

## **Site Visits**

Site visits will be conducted weekly pursuant to Labor Code 16432(d). Information on certified payrolls will be verified by visual inspection and random in-person worker interviews.

## **Required Forms**

The required forms are available for download in the Elations system. Copies of completed, signed forms should be forwarded to the appropriate agency and uploaded into Elation for verification.

### **Prior to Construction Forms**

1. Checklist of Labor Law Requirements

The Design-Build contractor and each subcontractor at all tiers must complete and submit this form acknowledging the California Labor Codes Regulations governing public works projects.

2. Division of Apprenticeship Standards Form DAS 140

Public Works Contract Award Information

- The Design-Build contractor and each subcontractor at all tiers must complete and submit this form to the local Apprenticeship Committee to inform them of the award of your contract.
- Submit the DAS 140 to the Joint Apprenticeship Training Committee (JATC) for each apprentice able craft or trade within the area of the project site. The Design-Build contractor and each subcontractor at all tiers must submit this form within ten (10) days of the date of the execution of the contract but no later than the first day the contractor has workers employed on-site.

3. Division of Apprenticeship Standards Form DAS 142

Request for Dispatch of an Apprentice

- The Design-Build contractor and each subcontractor at all tiers must complete and submit a Request for Dispatch of an Apprentice in writing at least 72 business hours prior to the date apprentices are needed.
- Submit the DAS 142 to each of the JATCs in the area of the project for each apprenticeable craft, until the required number of apprentices has been provided. If the required number of apprentices is not provided and a request has been submitted to all of the Committee's in the area of the project, then the contractor shall be considered in compliance.

### **During Construction Forms**

1. Statement of Employer Payments

- i Must be submitted with the first certified payroll, when prevailing wage rates are updated, and when there is a change in fringe benefits.
- i Additional annuity payments can be indicated in the notes section of the CPR and a union dispatch slip should be uploaded into the Elation System.

2. California Apprentice Council Training Fund Contribution (CAC –2)

The training fund contributions to the CAC are due on the 15<sup>th</sup> of each month for work performed during the preceding month. Refer to the DIR applicable prevailing wage

determinations for the amount owed for each hour of work performed for journeymen and apprentices.

3. Statement of Non-Performance (when applicable)

- i This form is submitted when the contractor is not working on the job site for a period of more than one week but has not completed their work. Does not need to be submitted until after the first certified payroll report is received.
- i One form may be submitted for consecutive non-performing weeks.

4. Certified Payroll Reporting Form

- i Any person employed upon the project that is working with tools must be listed on the certified payroll including but not limited to owners, operators, surveyors, and foremen.
- i The certified payroll records shall be submitted and maintained electronically subject to the following conditions:
  - i. The certified payroll reports contain all of the information required by California Labor Code Section 1776. The information must include name, address, social security number, craft, classification, wages, and hours worked.
  - ii. The reports shall be in a format and/or use software that is readily accessible to Contractors, Awarding Bodies, LCPs, the DIR, and the DOL.
- i Certified Payroll submitted to DSI, the DLSE, or another entity within the DIR must be in the form of a non-modifiable image or record that bears an electronic signature or includes a copy of any original certification made on paper.
- i The requirements for redacting information shall be followed when certified payroll records are disclosed to the public pursuant to California Labor Code Section 1776(e). This requirement will apply whether the records are provided electronically or as hard copies.
- i No Design-Build contractor or subcontractor shall be mandated to submit or receive electronic reports when it otherwise lacks the resources or capacity to do so, nor shall any Design-Build contractor or subcontractor be required to purchase or use proprietary software that is not generally available to the public.

5. Statement of Compliance Certificate

A Statement of Compliance shall accompany each certified payroll record.

6. Verification of Apprenticeship Status (DAS)

Verification is available on the DIR website at

<http://www.dir.ca.gov/DAS/appcertpw/AppCertSearch.asp>.

### **Project/Program Closeout**

#### **Contractor Affidavit**

Verifies the contractor's information, work classifications used, type of work completed, first payroll report date to final payroll report date, and how the apprenticeship utilization requirement was reached.

### **Apprenticeship Utilization**

California Labor Codes require Contractors to hire apprentices unless the total construction contract for the project is less than \$30,000 or it is not an apprenticeable craft.

Contractors, including Design-Build, General or Specialty subcontractors shall employ registered apprentices during the performance of public works in accordance with the required one (1) hour of work performed by an apprentice for every five (5) hours of work performed by a journeyman. Unless an exemption has been granted, the contractor shall employ apprentices for the number computed above, before the end of the contract or provide good faith effort documentation.



## **Section 2: Prior to Construction Forms**

- A. Checklist of Labor Law Requirements
- B. Public Works Contract Award Information (DAS 140 Form)
- C. Request for Dispatch of an Apprentice (DAS 142 Form)

# Checklist of Labor Law Requirements

(CCR Title 8, Section 16421)

Ultimately the prime contractor is liable for their sub and specialty contractors. This checklist is a useful tool for the prime contractor to ensure that their sub and specialty contractors know their responsibilities on public works projects. Contractors who understand and comply with the law are more likely to deliver the job on time, on budget and done right the first time. We suggest the prime contractor encourage completion of this checklist by their sub and specialty contractors.

NAME (PRINT) \_\_\_\_\_ DATE \_\_\_\_\_

COMPANY \_\_\_\_\_ PHONE \_\_\_\_\_

ADDRESS \_\_\_\_\_ FAX \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PROJECT MANAGER \_\_\_\_\_ SUPERINTENDENT/FOREMAN \_\_\_\_\_

CERTIFIED PAYROLL \_\_\_\_\_ PHONE/EXT. \_\_\_\_\_

CONTRACTOR LICENSE NO. \_\_\_\_\_ EXP. DATE \_\_\_\_\_ SPECIALTY LICENSE NO. \_\_\_\_\_

SELF-INSURED CERTIFICATE NO. \_\_\_\_\_ WORKERS COMP. POLICY NO. \_\_\_\_\_

PROJECT NAME \_\_\_\_\_ PROJECT #/BID PACKAGE# \_\_\_\_\_

AWARDING BODY \_\_\_\_\_ ADVERTISEMENT DATE \_\_\_\_\_

IF SUB-CONTRACTING, LIST YOUR PRIME/GENERAL CONTRACTOR \_\_\_\_\_

CONTRACT AWARD AMOUNT \_\_\_\_\_

THE FEDERAL AND STATE LABOR LAW REQUIREMENTS APPLICABLE TO THE CONTRACT ARE COMPOSED OF, BUT NOT LIMITED TO, THE FOLLOWING:

## ☐ **Payment of Prevailing Wage Rates**

The contractor to whom the contract is awarded and its subcontractors hired for the public works project are required to pay not less than the specified general prevailing wage rates to all workers employed in the execution of the contract. *Labor Code Section 1770 et seq.*

The contractor is responsible for ascertaining and complying with all current general prevailing wage rates for crafts and any rate changes that occur during the life of the contract. Information on all prevailing wage rates and all rate changes are to be posted at the job site for all workers to view. Additionally, current wage rate information can be found at the DLSR web site, [www.dir.ca.gov/dlsr/statistics\\_research.html](http://www.dir.ca.gov/dlsr/statistics_research.html).

## ☐ **Apprentices**

It is the duty of the contractor and subcontractors to employ registered apprentices on the public works project and to comply with all aspects of *Labor Code Section 1777.5*, relating to Apprentices on Public Works. (1) Notify approved apprenticeship programs of contract award; (2) employ apprentices; (3) pay training fund contributions.

## ☐ **Penalties**

There are penalties required for contractor's/subcontractor's failure to pay prevailing wages and for failure to employ apprentices, including forfeitures and debarment under *Labor Code Sections 1775; 1776; 1777.1; 1777.7 and 1813*.

## ☐ **Certified Payroll Reports**

Under *Labor Code Section 1776*, contractors and subcontractors are required to keep accurate payroll records showing the name, address, social security number and work classification of each employee and owner performing work; also the straight time and overtime hours worked each day for each week, the fringe benefits, and, the actual per diem wage paid to each owner, journey person, apprentice worker or other employee hired in connection with the public works project.

This requirement includes and applies to all subcontractors performing work on Awarding Body projects even if their portion of the work is less than one half of one percent (0.05%) of the total amount of the contract.

The certified payroll records shall contain the same data fields listed on the *Public Works Payroll Reporting Form (A-1-131)* and contain or is accompanied by a declaration made under penalty of perjury. (*California Code of Regulations, Section 16401*).

Prime Contractors are responsible for submittal of their payrolls and those of their respective subcontractors as the package. Any payroll not submitted in the proper form will be rejected. In the event that there has been no work performed during a

PSCBA FORMS - FOR INFORMATION ONLY  
DOCUMENT 00.73-49A

## Checklist of Labor Law Requirements, continued

given week, the Certified Payroll Report shall be annotated: "No work" for that week or a Non-Performance Statement must be submitted.

Employee payroll records shall be certified and shall be made available for inspection at all reasonable hours at the principal office of the contractor/subcontractor, or shall be furnished to any employee, or his/her authorized representative on request, pursuant to *Labor Code Section 1776*.

Under *Labor Code Section 1776(g)* there are penalties required for contractor's/subcontractor's failure to maintain and submit copies of certified payroll records on request.

☐ **Nondiscrimination in Employment**

There exist prohibitions against employment discrimination under *Labor Code Sections 1735 and 1777.6*, the *Government Code*, the *Public Contracts Code*, and *Title VII of the Civil Rights Act of 1964*.

☐ **Kickbacks Prohibited**

Contractors and subcontractors are prohibited from recapturing wages illegally by accepting or extracting "kickbacks" from employee wages under *Labor Code Section 1778*.

☐ **Acceptance of Fees Prohibited**

There exists a prohibition against contractor/subcontractor acceptance of fees for registering any person for public work under *Labor Code Section 1779*; or for filling work orders on public works contracts pursuant to *Labor Code Section 1780*.

☐ **Listing of Subcontractors**

All prime contractors are required to list properly all subcontractors hired to perform work on the public works projects covering more than one-half of one percent, pursuant to *Government Code Section 4104*.

☐ **Proper Licensing**

Contractors are required to be licensed properly and to require that all subcontractors be properly licensed. Penalties are required for employing workers while unlicensed under *Labor Code Section 1021* and under the California Contractor License Law found at *Business and Professions Code Section 7000 et seq.*

☐ **Unfair Competition Prohibited**

Contractors and sub-contractors are prohibited from engaging in unfair competition as specified under *Business and Professions Code Sections 17200 to 17208*.

☐ **Workers Compensation Insurance**

*Labor Code Section 1861* requires that contractors and subcontractors be insured properly for Workers Compensation.

☐ **OSHA**

Contractors and subcontractors are required to abide by the Occupational, Safety and Health laws and regulations that apply to the particular construction project.

☐ **Proof of Eligibility/Citizenship**

The federal prohibition against hiring undocumented workers, and the requirement to secure proof of eligibility/citizenship from all workers, is required.

☐ **Itemized Wage Statement**

*Labor Code Section 226* requires that employees be provided with itemized wage statements.

### CERTIFICATION

I acknowledge that I have been informed and am aware of the foregoing requirements and that I am authorized to make this certification on behalf of \_\_\_\_\_  
(COMPANY NAME)

I fully understand that failure to comply with any of the above requirements may subject me, or my company, to penalties as provided above.

Contractor \_\_\_\_\_  
(SIGNATURE) (DATE)

Awarding Agency /Labor Compliance Program \_\_\_\_\_  
(SIGNATURE) PSCBA FORMS - FOR INFORMATION ONLY  
DOCUMENT 00-73-49A  
(DATE)



## PUBLIC WORKS CONTRACT AWARD INFORMATION

Contract award information must be sent to your Apprenticeship Committee if you are approved to train. If you are not approved to train, you must send the information (which may be this form) to ALL applicable Apprenticeship Committees in your craft or trade in the area of the site of the public work. Go to: <http://www.dir.ca.gov/das/PublicWorksForms.htm> for information about programs in your area and trade. You may also consult your local Division of Apprenticeship Standards (DAS) office whose telephone number may be found in your local directory under California, State of, Industrial Relations, Division of Apprenticeship Standards.

**Do not send this form to the Division of Apprenticeship Standards.**

NAME OF YOUR COMPANY	CONTRACTOR'S STATE LICENSE NO
MAILING ADDRESS- NUMBER & STREET, CITY, ZIP CODE	AREA CODE & TELEPHONE NO.
NAME & ADDRESS OF PUBLIC WORKS PROJECT	DATE YOUR CONTRACT EXECUTED
	DATE OF EXPECTED OR ACTUAL START OF PROJECT
NAME & ADDRESS OF PUBLIC AGENCY AWARDED CONTRACT	ESTIMATED NUMBER OF JOURNEYMEN HOURS
	OCCUPATION OF APPRENTICE
THIS FORM IS BEING SENT TO: (NAME & ADDRESS OF APPRENTICESHIP PROGRAM(S))	ESTIMATED NUMBER OF APPRENTICE HOURS
	APPROXIMATE DATES TO BE EMPLOYED

***This is not a request for dispatch of apprentices.***

*Contractors must make a separate request for actual dispatch, in accordance with Section 230.1(a) California Code of Regulations*

***Check One Of The Boxes Below***

1. ☐ We are already approved to train apprentices by the \_\_\_\_\_  
Apprenticeship Committee. We will employ and train under their Standards. Enter name of the Committee
2. ☐ We will comply with the standards of \_\_\_\_\_  
Apprenticeship Committee for the duration of this job only. Enter name of the Committee
3. ☐ We will employ and train apprentices in accordance with the California Apprenticeship Council regulations, including § 230.1 (c) which requires that apprentices employed on public projects can only be assigned to perform work of the craft or trade to which the apprentice is registered and that the apprentices must at all times work with or under the direct supervision of journeyman/men.

Signature

Date

Typed Name

Title

**State of California - Department of Industrial Relations DIVISION  
OF APPRENTICESHIP STANDARDS**



# REQUEST FOR DISPATCH OF AN APPRENTICE – DAS 142 FORM

**DO NOT SEND THIS FORM TO DAS**

You may use this form to request dispatch of an apprentice from the Apprenticeship Committee in the craft or trade in the area of the public work. Go to: <http://www.dir.ca.gov/databases/das/pwaddrstart.asp> for information about programs in your area and trade. You may also consult your local Division Apprenticeship Standards (DAS) office whose telephone number may be found in your local directory under California, State of, Industrial Relations, Division of Apprenticeship Standards. **Except for projects with less than 40 hours of journeyman work, you must request and employ apprentices in no less than 8 hour increments.**

<b>Date:</b> _____	<b>Contractor Requesting Dispatch:</b>
<b>To Applicable Apprenticeship Committee:</b>	<b>Name:</b> _____
<b>Name:</b> _____	<b>Address:</b> _____
<b>Address:</b> _____	_____
_____	<b>License No.</b> _____
<b>Tel. No.</b> _____ <b>Fax No.</b> _____	<b>Tel. No.</b> _____ <b>Fax No.</b> _____

## Project Information:

**Contract No.** \_\_\_\_\_

**Name of the Project:** \_\_\_\_\_

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

## Dispatch Request Information:

**Number of Apprentice(s) Needed:** \_\_\_\_\_ **Craft or Trade:** \_\_\_\_\_

**Date Apprentice(s) to Report:** \_\_\_\_\_ (72 hrs. notice required) **Time to Report:** \_\_\_\_\_

**Name of Person to Report to:** \_\_\_\_\_

**Address to Report to:** \_\_\_\_\_

\_\_\_\_\_

*You may use this form to make your written request for the dispatch of an apprentice. Requests for dispatch must be in writing and submitted at least 72 hours in advance (excluding weekends and holidays) via first class mail, fax or email. **Proof of submission may be required.** Please take note of California Code of Regulations, Title 8, § 230.1 (a) for all applicable requirements regarding apprenticeship requests and/or visit*

<http://www.dir.ca.gov/DAS/DASApprenticesOnPublicWorksSummaryOfRequirements.htm>

DAS 142 (Revised 04/14)

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DOCUMENT 00 73 49A



## **Section 3: During Construction Submittals**

- A. Statement of Employer Payments
- B. CAC Training Fund Contributions (CAC-2 Form)
- C. Statement of Non-Performance
- D. Public Works Payroll Reporting From (A-1-131 Form)
- E. Verification of Apprenticeship Status

# Statement of Employer Payments



Date:		In Reply, Refer to Case No:	
Prime:			
Subcontractor:			
PROJECT NAME:			
PROJECT CONTRACT NO.:		County/location:	

## HEALTH AND WELFARE

NAME OF PLAN	Address, City and Zip		
ADMINISTRATOR	Address, City and Zip		
CLASSIFICATION(S) USED	CONTRIBUTION PER CLASSIFICATION PER HOUR		
CONTRIBUTIONS:	WEEKLY	MONTHLY	QUARTERLY
			ANNUALLY

## PENSION

NAME OF PLAN	Address, City and Zip		
ADMINISTRATOR	Address, City and Zip		
CLASSIFICATION(S) USED	CONTRIBUTION PER CLASSIFICATION PER HOUR		
CONTRIBUTIONS:	WEEKLY	MONTHLY	QUARTERLY
			ANNUALLY

## VACATION/HOLIDAY

NAME OF PLAN	Address, City and Zip		
ADMINISTRATOR	Address, City and Zip		
CLASSIFICATION(S) USED	CONTRIBUTION PER CLASSIFICATION PER HOUR		
CONTRIBUTIONS:	WEEKLY	MONTHLY	QUARTERLY
			ANNUALLY

## TRAINING

NAME OF PLAN	Address, City and Zip		
ADMINISTRATOR	Address, City and Zip		
CLASSIFICATION(S) USED	CONTRIBUTION PER CLASSIFICATION PER HOUR		
CONTRIBUTIONS:	WEEKLY	MONTHLY	QUARTERLY
			ANNUALLY

IF YOU USE OTHER PLANS NOT LISTED ABOVE, YOU MAY USE THE BACK OF THIS FORM TO PROVIDE THIS ADDITIONAL INFORMATION


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Division of Apprenticeship Standards (DAS)

## CAC - Training Fund Contributions

You must enter all requested information in order to ensure successful submission and processing of your payment.  
Training Fund Contributions are due on the 15th of each month.

All fields with \* are required.

You must use the **BUTTON** on the bottom of the page to submit for an invoice coupon.

TO NAVIGATE BETWEEN FIELDS, DO NOT HIT RETURN OR ENTER KEY AFTER EACH ENTRY. USE THE TAB KEY INSTEAD.

You need to have a working printer currently connected to your computer in order to print the complete paper form in the end of this session so that you can mail it with your payment.

### Training Fund Contributions Form CAC2

Date: 9/25/2014

Contractor/Sub Contractor making contributions	Contractor	Period covered by contribution (from – to)	Jobsite Location (including County)
* Name: <input type="text"/>	* License Number: <input type="text"/>	* Period Start: <input type="text"/>	If applicable, give name of school, hospital, building, etc. <input type="text"/>
* Address: <input type="text"/>	* Contract/Project Number <input type="text"/>	* Period End: <input type="text"/> (MM/DD/YYYY)	Comments: <input type="text"/>
* City: <input type="text"/>			
* State: <input type="text"/>			
* ZIP: <input type="text"/>			

* Name of the submitting party:	* Submitter's Title:	* Submitter's Email:	* Submitter's Phone: e.g., (999) 999-9999
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Instructions:** You may want to use the keyboard TAB key to navigate the fields and the Up ^ | Down V ARROW keys to select a list item.

	* County of Work	* Classification <sup>1</sup>	* Hours (min.: 0.5; max: 9 999.99)	* Rate (min.: 0.01; max: \$9.99)	Amount
*1)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	** <input type="text"/>	\$ ** <input type="text"/>	\$ 0.00
2)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
3)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
4)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
5)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
6)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
7)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00
8)	Select a county <input type="text"/>	Select an occupation <input type="text"/>	<input type="text"/>	\$ <input type="text"/>	\$ 0.00

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9)	Select a county	Select an occupation		\$		\$ 0.00
10)	Select a county	Select an occupation		\$		\$ 0.00
11)	Select a county	Select an occupation		\$		\$ 0.00
12)	Select a county	Select an occupation		\$		\$ 0.00
13)	Select a county	Select an occupation		\$		\$ 0.00
14)	Select a county	Select an occupation		\$		\$ 0.00
15)	Select a county	Select an occupation		\$		\$ 0.00
16)	Select a county	Select an occupation		\$		\$ 0.00
17)	Select a county	Select an occupation		\$		\$ 0.00
18)	Select a county	Select an occupation		\$		\$ 0.00
19)	Select a county	Select an occupation		\$		\$ 0.00
20)	Select a county	Select an occupation		\$		\$ 0.00

Footnote 1 – If you are unable to locate the occupation in the pull down menu, please click on this link:  
<http://www.dir.ca.gov/databases/das/aigstart.asp> for specific information assistance.

**TOTAL AMOUNT: \$ 0.00**

When done with some or all the entries above, please carefully review and then enter the green code you see below:

**22749**

Calculate Total Amount

August 2014

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# **TO BE TYPED ON COMPANY LETTERHEAD**

## **STATEMENT OF NON-PERFORMANCE**

Payroll # \_\_\_\_\_

Date \_\_\_\_\_

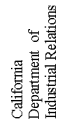
I do hereby state that no persons employed on the construction of the

\_\_\_\_\_ Project, for \_\_\_\_\_  
(Project Name) (Awarding Body)

Company, Contract No. \_\_\_\_\_ during the payroll period commencing on the  
\_\_\_\_\_th day of \_\_\_\_\_, 2007 and ending on the \_\_\_\_\_th day of  
\_\_\_\_\_, 2007.

\_\_\_\_\_  
(Company Name)

\_\_\_\_\_  
(Authorized Signer)



**CERTIFICATION MUST be completed**  
(See reverse side)

\*OTHER—Any other deductions, contributions and/or payments whether or not included or required by prevailing wage determinations must be separately listed. Use extra sheet(s) if necessary

S = STRAIGHT TIME  
O = OVERTIME  
SDI = STATE DISABILITY INSURANCE



**NOTICE TO PUBLIC ENTITY**

**For Privacy Considerations**

**Fold back along dotted line prior to copying for release to general public (private persons).**

(Paper Size then 8-1/2 x 11 inches)

-----

I, \_\_\_\_\_, the undersigned, am the  
(Name – print)

\_\_\_\_\_ with the authority to act for and on behalf of  
(Position in business)

\_\_\_\_\_, certify under penalty of perjury  
(Name of business and/or contractor)

that the records or copies thereof submitted and consisting of \_\_\_\_\_  
(Description, number of pages)

are the originals or true, full, and correct copies of the originals which depict the payroll record(s)  
of the actual disbursements by way of cash, check, or whatever form to the individual or  
individuals named.

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

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

A public entity may require a stricter and/or more extensive form of certification.


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## Apprentice certification

Apprenticeship certification for public works

Enter search string ( LLLLF9999 ) here

How to compile the search string:

The search string is a total of nine letters and numbers (no characters ' , - , etc): the first four letters of the last name (use spaces to make four letters if the last name is shorter than four letters), the first letter of the first name and the last four digits of the social security number (LLLLF9999). Letters can be entered as lower or upper case.

Examples:

Uncle Sam ssn 123-45-6789 would be entered as Sam U6789  
 Goddess Minerva ssn 123-45-5555 would be entered as MineG5555  
 Richard Al-Ham ssn 111-44-1111 would be entered as AlhaR1111  
 Robert O'Brian ssn 111-22-3333 would be entered as OBriR3333  
 James McHenry ssn 555-66-1234 might be entered as McHeJ1234 or Mc HJ1234

If you cannot find the individual you are looking for, complete the certifications you have and see the notes below.

If a search string that was entered does not match with any apprentices in the Division of Apprenticeship Standards (DAS) database, this could be due to any of the following:

1. Not a registered apprentice.
2. The submitted search string does not match to DAS records (either the database has the wrong search criteria or you have the wrong search criteria).
3. The apprentice agreement has not been submitted to DAS or has not been entered into the database (agreements must be submitted within 30 days of the date that the apprentice signed the agreement).

If you believe that the apprentice should be reported as registered and is not; please contact your local office of the [Division of Apprenticeship Standards](#).

Division of Apprenticeship  
Standards(DAS)

### Quick Links

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**DAVILLIER-SLOAN, INC.**  
**LABOR MANAGEMENT CONSULTANTS**

## **Section 4: Closeout**

This form must be submitted to DSI  
during project/program closeout

A. Contractor Affidavit

Contractor Affidavit  
Contract # \_\_\_\_\_

1. I am the \_\_\_\_\_ (owner, officer, partner) of  
\_\_\_\_\_ (Company) who performed work on the  
\_\_\_\_\_ (Project) in the classification (s) of  
\_\_\_\_\_.  
The labor performed by these workers can best be described by  
\_\_\_\_\_.

2. During the payroll periods commencing on \_\_\_\_\_ and  
ending on \_\_\_\_\_ all persons employed by my company on  
this project have been paid the specified prevailing rate of per diem wages for  
the specified craft or classification pursuant to Labor Code Section 1771<sup>1</sup>.

3. The apprenticeship committee (s) either denied or failed to respond to our  
request for the dispatch of apprentices, and therefore all workers were  
classified as journeyman

Or

4. Apprentice (s) worked a total of \_\_\_\_\_ hours and \_\_\_\_\_  
journeyman worked a total of \_\_\_\_\_ hours establishing an apprentice \  
journeyman ratio in hours of \_\_\_\_\_ to \_\_\_\_\_.

Or

5. Apprentices were employed in accordance with the DAS exemption that  
required one apprentice for every five journeyman employed on each day of  
the contract.

Executed this \_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_, at \_\_\_\_\_, California.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
<sup>1</sup> Except for public works project of one thousand dollars (\$1000) or less , not less than the general prevailing rate of  
per diem wages for work of a similar character in the locality in which the public work is performed, and not less than  
the general prevailing rate of per diem wages for holiday and overtime work fixed as provided in this chapter, shall be  
paid to all workers employed on public works.

**EXHIBIT A    (Letter of Assent)**

**PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT**

for the

**COUNTY OF ALAMEDA  
CONTRACTOR AGREEMENT TO BE BOUND**

The undersigned, as a Contractor or Subcontractor (CONTRACTOR) on the County of Alameda, (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECTS, and in further consideration of the mutual promises made in the "Project Stabilization/Community Benefits Agreement for the County of Alameda Project" (hereinafter AGREEMENT), a copy of which was received and is acknowledged, hereby:

- (1)     Accepts and agrees to be bound by the terms and conditions of the AGREEMENT, together with any and all amendments and supplements now existing or which are later made thereto:
- (2)     The CONTRACTOR agrees to be bound by the legally established local trust agreements as set forth in Article 14 of this AGREEMENT.
- (3)     The CONTRACTOR authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the CONTRACTOR;
- (4)     Certifies that it has no commitments or agreements which would preclude its full and complete compliance with the terms and conditions of said AGREEMENT.
- (5)     Agrees to secure from any CONTRACTORS (as defined in said AGREEMENT) which is or becomes a Subcontractor (of any tier) to it, a duly executed Agreement to be Bound in form identical to this document.

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

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Name of Prime Contractor or Higher  
Level Subcontractor)

\_\_\_\_\_  
(Authorized Officer & Title)

**CA Number** \_\_\_\_\_

\_\_\_\_\_  
(Address)

Contract Or Project # \_\_\_\_\_

\_\_\_\_\_  
(Phone)

\_\_\_\_\_  
(Fax)

**FOR INFORMATION ONLY**

**PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT**

**for the**

**COUNTY OF ALAMEDA**

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## **PREAMBLE**

This Agreement is made and entered into on this \_\_\_\_ day of \_\_\_\_\_ 2013, by and between the County of Alameda ("County") together with Contractors and/or subcontractors, who shall subsequently become signatory to this Agreement by signing the "Contractor Agreement To Be Bound" (Exhibit A), ("Contractors"), the Building and Construction Trades Council of Alameda County, AFL-CIO ("Council") and the Local Unions signatory hereto, all in their behalf and in behalf of the various Local Unions involved, ("Union(s)") for the construction of all Covered Projects ("Covered Projects").

## **Recitals**

WHEREAS, the Projects described in this Agreement have been identified by the County as those in which a Project Stabilization/Community Benefits Agreement would benefit the County; and

WHEREAS, the Contractors will be engaged in construction of the project; and

WHEREAS, a skilled labor pool represented by Building Trades Unions will be required to complete the work involved; and

WHEREAS, the Building Trades Unions agree to cooperate in every way possible with employees of the Contractors; and

WHEREAS, the parties to this Agreement mutually agree that safety, quality, productivity and labor harmony are primary goals; and

WHEREAS, the County desires to provide, enhance and encourage construction training and employment opportunities for Alameda County residents and small business enterprises within the County through apprentice and pre-apprentice programs; and

WHEREAS, the County also desires to use this Agreement as a vehicle for building the capacity of Alameda County residents and businesses and to maximize their potential to successfully participate in other large scale projects; and

WHEREAS, the parties recognize the need for safe, efficient and speedy construction in order to reduce unnecessary delays and result in timely completion of the project; and

WHEREAS, the parties desire to mutually establish and stabilize wages, hours and working conditions for the employees employed on the project by the Contractors, and further to encourage close cooperation to achieve a satisfactory, continuous and harmonious relationship between the parties to this Agreement;

WHEREAS, the County of Alameda's mission is to enrich the lives of all residents through visionary policies and accessible, responsible and effective services and historically the County



has supported contracting outreach programs that recognize the economic and workforce development potential of capital construction projects on government owned facilities; and

WHEREAS, the Parties recognize that disadvantaged individuals, families, and communities within the county experience high unemployment and are also often recipients of County services, and that these disadvantaged populations may economically benefit through participation in local hire, apprenticeship and pre-apprenticeship programs; and

WHEREAS, the Union(s), Contractors, subcontractors, and the County wish to insure labor peace at the Covered Project sites devoid of any disruption that could jeopardize the schedule and timeliness of the construction process, where both Contractors that are signatory to collective bargaining agreements of the Union(s) are supervising employees that are members of the Union(s) and where Contractors that are not Signatory to collective bargaining agreements are supervising employees;

NOW THEREFORE, the parties, in consideration of the mutual promises and covenants herein contained, mutually agree as follows:

## ARTICLE 1

### DEFINITIONS

1.1 For purposes of this Agreement, the following terms will have the following meanings:

“Acceptance” shall mean action by the County notifying Contractor and other entities of Completion, as required by and in accordance with contract terms and relevant applicable statutes.

“Agreement” shall mean this Project Stabilization/Community Benefit Agreement.

“Alternative Employees” shall mean an employee whose services have been obtained from other than the Union referral facilities as permitted in Section 19.6 of this Agreement.

“Apprentice” shall mean a person enrolled in a State approved apprenticeship training program administered by a Joint Labor-Management Apprenticeship Training Committee (JATC).

“Completion” means that the work of Contractors’ is completed, as follows:

1. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by the public agency, or its agent, accompanied by a cessation of labor on the work of improvement.
2. The acceptance by the public agency, or its agent, of the work of improvement.

“Contractors” means all contractors and subcontractors at all tiers, any individual, firm, partnership or corporation, or combination thereof, including joint ventures, which is an

independent business enterprise and has entered into a contract with the County or any of its contractors or subcontractors at any tier, with respect to the construction work covered by this Agreement and necessary for the project or any part thereof, including construction building material delivery (if the material is for direct incorporation) and removal truckers, trucking companies and trucking brokers, including the operating of construction equipment, performance of labor and/or installation of materials.

“Coordinator” shall mean the company or individual designated or retained by the County to administer this Agreement.

“Core Employee” shall mean an individual meeting the criteria listed in Section 19.1.1-19.1.5.

“Council” shall mean the Building and Construction Trades Council of Alameda County.

“County” shall mean the County of Alameda acting by and through its Board of Supervisors, Agency and Department heads and administrative staff.

“Covered Projects” and “Projects” means projects covered by the Agreement.

“Covered Work” means work done on the project and subject to the provisions of this Agreement.

“Disadvantaged Population” shall mean those Residents of Alameda County who meet at least one of the following criteria: household income below 50% of the Alameda County median, non-minor dependent youth (AB-12 youth – emancipated foster youth), homeless, welfare recipients, have a history of involvement with the criminal justice system, are unemployed, or a single parent.

“Emergency Work” shall mean those projects undertaken when an immediate or imminent critical impact to a facility or to the ability to provide essential services is likely within 30 days should no further action be taken, or in circumstances where mandatory environmental, health and/or safety requirements will be violated without said project.

“General Prevailing Wage Determination” shall mean the decisions made by the Director of the California Department of Industrial Relations (DIR) establishing a journeyman craft or classification's prevailing wage determination, holiday, advisory scope of work, or travel and subsistence provision.

“Local Hiring Goals” shall mean the Resident and Apprentice hiring goals set forth in Article 17 and Article 18 of this Agreement.

“Local Hiring Program” shall mean the program set forth in Article 17 and Article 18 of this Agreement intended to achieve the inclusion of County Residents in the employment and apprenticeship opportunities created by the Covered Work.

"Master Labor Agreement" or "MLA" shall mean the collective bargaining agreement of each craft Union that is Signatory to this Agreement.

"New Apprentice" shall mean an Alameda County Resident who on the date that such individual is hired or assigned to perform the applicable work, is newly enrolled (less than one year) in a labor-management apprenticeship program that is currently registered with the State of California's Division of Apprenticeship Standards.

"Owner Operator" shall mean a sole individual that owns and drives/operates a maximum of one unit and who is employed in the movement or transportation of materials or goods of another. The owner operator shall be carried on the payroll of the entity that employs or otherwise uses the Owner/Operator. The Owner/Operator shall direct a maximum of one unit which he or she shall drive themselves. In addition the owner operator must provide documentation of insurance, a business license, and a valid motor carrier permit issued solely in their name.

"Post Disaster Work" shall mean County approved construction projects consistent with Post Disaster response and recovery efforts per the California Government Code Section 20168 where the public interest and necessity demand immediate expenditure of public funds to safeguard life, health, or property following a local, state or federally declared disaster per the Stafford Act.

"Project Manager" shall mean the person or persons designated by the County of Alameda Board of Supervisors to act on behalf of the County in all matters involving or related to individual Covered Projects..

"Resident" shall mean an individual who has lived or resided in Alameda County for a period of not less than thirty (30) calendar days prior to the date of dispatch/referral of that individual by the Union to a Contractor performing work on the project or for a period of not less than thirty (30) calendar days prior to applying for work or inclusion in the Local Hire Program if the individual is an Alternative Employee, a Core Employee, a member of a Disadvantaged Population, or a Local Hire Program applicant.

"Signatory" shall mean those Unions who have through their officers and or agents executed this Agreement.

"Sole Proprietor" shall mean an owner who will self-perform the designated Covered Project Work without hiring field support staff for the Project.

"Trust Agreements" shall mean the agreements between Unions and employers and or employer associations to govern trust funds contributed on behalf of covered workers for benefits for said workers.

"Union" or "Unions" shall mean the Building and Construction Trades Council of Alameda County and its affiliated local unions Signatory to the Agreement, acting on their own behalf or on behalf of their respective affiliates and member organizations.

## ARTICLE 2

### PURPOSE

- 2.1 The purposes of this Agreement are to promote efficient construction operations on the Projects, to insure an adequate supply of skilled craftspeople and to provide for peaceful, efficient and binding procedures for settling labor disputes. In so doing, the parties to this Agreement establish the foundation to promote the public interest, to provide a safe work place, to assure high quality construction, to ensure uninterrupted construction Projects, and to secure optimum productivity, on-schedule performance and County satisfaction.
- 2.2 It is the intent of the parties to set out uniform and fair working conditions for the efficient completion of the Projects, maintain harmonious labor/management relations and eliminate strikes, lockouts and other delays.
- 2.3 The parties agree that one of the primary purposes of this Agreement is to avoid the tensions that might arise on the Projects if union and nonunion workers of different employers were to work side by side on the Projects thereby leading to labor disputes that could delay completion of the Projects.
- 2.4 This Agreement is entered into pursuant to and consistent with California Public Contract Code ("PCC") Sections 2500 through 2502. PCC Section 2500(a)(3) requires a public entity PLA to include an agreed-upon protocol concerning drug testing for workers employed on the Projects, as set forth in Article 16.3.

## ARTICLE 3

### SCOPE OF AGREEMENT

- 3.1 The parties agree that this Agreement will cover all projects undertaken by the County of Alameda with a construction value of \$1 million or more. In addition, the Agreement will cover all projects with a construction value of \$1 million or more which are undertaken on behalf of the County or in circumstances where County is executing projects for Special Districts,. The parties further agree that the Board of Supervisors may at their discretion elect to include any project with a value less than \$1 million under the terms of this Agreement.
- 3.2 This Agreement covers all on-site construction, fabrication, demolition, alteration, painting or repair of buildings, structures, landscaping, temporary fencing and other work and related activities that are within the craft jurisdiction of one of the Union(s) and that is part of the work, including site preparation, survey work, and all construction, demolition or improvements required to be performed as a condition of approval by the County.

- 3.3 This Agreement shall apply only to construction/craft employees, performing work on projects represented by the Signatory Unions, and shall not apply to Contractors' supervisors, technical or non-manual employees including, but not limited to, executives, engineers, office and clerical employees, drafters, architects, supervisors, timekeepers, messengers, guards, other employees above the classification of general foreman, inspectors, material testers, and/or x-ray technicians, except to the extent that such inspectors, material testers, and/or x-ray technicians are customarily covered by the MLA and as to which classification a prevailing wage determination has been published.
- 3.4 There shall be no limitation or restriction upon the choice of materials or upon the full use and installation of equipment, machinery, package units, factory pre-cast, prefabricated or preassembled materials, tools or other labor-saving devices. The lawful fabrication provisions of the appropriate national or local agreements shall be applicable. The covered projects include work necessary for the covered projects and/or in temporary yards or areas adjacent to and dedicated to the covered projects, and at any batch plant(s) constructed or used solely to supply materials to the Covered Projects, when those sites or processes are dedicated exclusively to the covered projects.
- 3.5 This Agreement covers all on-site fabrication work over which the County or Contractors possess the right of control (including work done for the covered projects in any temporary yard or area established for the Covered Projects). Additionally, any offsite work, including fabrication, necessary for the Covered Projects defined herein, that is lawfully covered by a current MLA or local addenda to a National Agreement of the applicable Union(s) that is in effect as of the execution of this Agreement shall be considered covered work under this Agreement.
- 3.6 This Agreement shall apply to any start-up, calibration, performance testing, repair, maintenance, operational revisions to systems and/or subsystems performed up to 9 months after Completion by the Contractors. It is understood the County reserves the right to perform any start-up, operation, repair, maintenance or revision of equipment or systems with employees of the County. If required, Contractor's personnel may make a final check and may direct their staff on site to make any necessary repairs to protect the terms of a manufacturer's guarantee or warranty of a piece of equipment.
- 3.7 The on-site installation or application of all items shall be performed by the craft having jurisdiction over such work as set forth under the provisions of this Agreement; provided, however, it is recognized that installation of specialty items which may be furnished by the County or a Contractor shall be performed by construction persons of the vendor or other companies where necessary to protect a manufacturer's warranty. The issue of whether it is necessary to use construction persons of the vendor or other companies to protect the manufacturer's warranty shall be subject to the grievance and arbitration clause of this Agreement.
- 3.8 It is recognized by the parties to this Agreement that the Coordinator designated in Article 9 below, and Contractors are acting only on behalf of said Coordinator and

Contractors, and said Coordinator and Contractors have no authority, either expressed, implied, actual, apparent or ostensible, to speak for or bind the County.

- 3.9 It is expressly agreed and understood that the County retains the right and ability to meet all competitive bidding requirements of public contracting law and to select the lowest responsive and responsible bidder who provides the County with best value within a stipulated sum regardless of union signatory status. Further, the County may, at its sole discretion, end, delay, and/or suspend any or all portions of the work and may combine, consolidate, modify and/or not build any one or more portions of work covered by this Agreement at any time.
- 3.10 It is expressly agreed and understood by the parties hereto that the County shall retain the right at all times to perform and/or subcontract all portions of the construction and related work on project sites not covered by this Agreement.
- 3.11 It is expressly agreed and understood by the parties hereto that the County shall have the right to purchase material and equipment from any source and the craftspersons will handle and install such material and equipment, subject to the requirements of Section 3.6.
- 3.12 Without limiting the foregoing, items specifically excluded from the scope of this Agreement include the following:
  - 3.12.1 The operation of equipment and machinery owned or controlled by the County and its subcontractors and not directly related to construction of covered projects;
  - 3.12.2 All employees of any Contractor or any other consultant of the County not performing construction craft labor within the scope of this Agreement;
  - 3.12.3 Any work performed on or near or leading to or on to the site of work covered by this Agreement and undertaken by state, county, city or other governmental bodies, or their Contractors, or by public utilities or their Contractors, and/or by the County or its Contractors (for work which is not part of the scope of this Agreement).
  - 3.12.4 Off-site maintenance of leased equipment and on-site supervision of such work;
  - 3.12.5 Non-construction support services contracted by the County or any Contractor in connection with covered projects;
  - 3.12.6 All work by employees of the County;
  - 3.12.7 Operations or maintenance work executed by the County;

- 3.12.8. All work on covered projects under any contract entered into prior to the date of this Agreement;
- 3.12.9. All warranty functions, warranty work, corrective work, repair and maintenance work on purchased equipment performed by manufacturers' representatives or vendors after Completion and acceptance of any covered projects by the County; and
- 3.12.10 All Post Disaster and Emergency Work as defined in Article 1.
- 3.13 The Council shall assist the County and its contractors in encouraging and soliciting subcontractors in bidding on all covered projects.

#### **ARTICLE 4**

##### **RELATIONSHIP BETWEEN PARTIES**

- 4.1 This Agreement shall only be binding on the Signatory parties hereto, and shall not apply to parents, affiliates, subsidiaries, or other divisions of the Coordinator and Signatory Contractors unless signed by such parent, affiliate, subsidiary, or other division of such company.
- 4.2 Each Contractor shall alone be liable and responsible for its own individual acts and conduct and for any breach or alleged breach of this Agreement. Any alleged breach of this Agreement by a Contractor or any dispute between the Signatory Union and the Contractor respecting compliance with the terms of this Agreement, shall not affect the rights, liabilities, obligations and duties between the signatory Union and each other Contractor party to this Agreement.
- 4.3 It is mutually agreed by the parties that any liability by a Signatory Union(s) to this Agreement shall be several and not joint. Any alleged breach of this Agreement by a signatory Union shall not affect the rights, liabilities, obligations and duties between the Signatory Contractors and the other Unions party to this Agreement.

#### **ARTICLE 5**

##### **ROLES AND RESPONSIBILITIES**

##### **SUBCONTRACTS**

- 5.1 Each Contractor, which includes all subcontractors of any tier, including trucking entities performing Covered Work on the Projects, agrees that neither it nor any of its subcontractors will subcontract any work to be done on the Project except to a person, firm, or corporation who is or becomes party to this Agreement by signing the Agreement

to be Bound attached to this Agreement as Exhibit "A". All Contractors performing Covered Work on the Project shall, as a condition to performing work on the Project, become Signatory to and perform all work under the terms of this Agreement.

- 5.2 A Contractor includes any person, firm or corporation who agrees under contract with another Contractor of any tier, to perform on the Project any part or portion of the construction work covered by the prime contract, including the operating of construction equipment, performance of labor and/or installation of materials.
- 5.3 Notwithstanding any other provisions of this Agreement, the Contractor, as appropriate, in conformance with paragraph 3.7 of this Agreement shall have the absolute right to award contracts or subcontracts for this Project notwithstanding the existence or nonexistence of any collective bargaining agreements between the prospective Contractor and any Union party, and provided that such Contractor is willing, ready and able to comply with this Project Stabilization/Community Benefits Agreement and shall execute a Letter of Assent (in the form attached as Exhibit A), should such Contractor be awarded work covered by this Agreement.
- 5.4 The furnishing of supplies, equipment or materials which are stockpiled for later use shall in no case be considered subcontracting and shall be covered to the extent permitted by law. The delivery of ready-mix, asphalt, aggregate, sand or other fill material which are directly incorporated into the construction process as well as the off-hauling of debris and excess fill material and/or mud, shall be covered by the terms and conditions of this Agreement.
- 5.5 Each Contractor with a contract directly with the County has the primary obligation for performance of all conditions of this Agreement, including the performance of all of that Contractor's subcontractors. This obligation cannot be relieved, evaded or diminished by subcontracting. Should a Contractor elect to subcontract, that Contractor shall continue to have such primary obligation.
- 5.6 Each Contractor, which includes all subcontractors of any tier performing work on the Project, shall give written notice to the Union(s) of any subcontract involving the performance of work covered by this Agreement within either five (5) business days of entering such subcontract or before the subcontractor commences work on the Project, whichever occurs first. Such notice shall specify the name and address of the subcontractor, the California State License Board license number of the Contractors and the scope of work to be performed. Written notice at a Pre-Job Conference shall be deemed written notice under this provision only for those subcontractors listed at the Pre-Job Conference.
- 5.7 Signatory Contractors:
  - 5.7.1 With regard to any Contractor that is independently signed to any Master Labor Agreement, this Agreement shall in no way supersede or prevent the enforcement of any subcontracting clause contained in such MLA, except as specifically set



forth in Section 5.7.2 below. Any such subcontracting clause in a MLA shall remain and be fully enforceable between each craft union and its signatory Contractors, and no provision of this Agreement shall be interpreted and/or applied in any manner that would give this Agreement precedence over subcontracting obligations and restrictions that exist between craft unions and their respective signatory Contractors under a MLA, except as specifically set forth in subsection 5.7.2 below.

- 5.7.2 If a craft union ("aggrieved union") believes that an assignment of work for this Project has been made improperly by a Contractor or subcontractor, even if that assignment was as a result of another craft union's successful enforcement of the subcontracting clause in its MLA, as permitted by subsection 5.7.1 above, the aggrieved union may submit a claim under the jurisdictional resolution procedure contained in Article 6 of this Agreement, and the decision rendered as part of that process shall be enforceable to require the Contractor or subcontractor that made the work assignment to assign that work prospectively to the aggrieved union. An award made to a craft union under the subcontracting clause of its MLA, as permitted pursuant to subsection 5.7.1 above, shall be valid and fully enforceable by that craft union unless it conflicts with a jurisdictional award made pursuant to this Agreement. If the award made under the MLA conflicts with the jurisdictional award, the award of damages under the former shall be null and void *ab initio*.

## ARTICLE 6

### WORK ASSIGNMENTS AND JURISDICTIONAL DISPUTES

- 6.1 The following language is specifically agreed to for the resolution of any Jurisdictional Disputes which may arise during the construction which is specifically covered by this Agreement. This agreement regarding resolution of jurisdictional disputes shall apply only to such disputes arising on Covered Projects.
- 6.2 There will be no strikes, no work stoppages, no picketing, sympathy strikes, slow downs or other interferences with the work because of jurisdictional disputes between signatory Unions. Individuals violating this section shall be subject to immediate discharge.
- 6.3 The assignment of Covered Work will be solely the responsibility of the Contractor performing the work involved; and such work assignments will be in accordance with the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the "Plan") or any successor Plan.
- 6.4 All jurisdictional disputes on this Project between or among the Building and Construction Trades Unions and the Contractors, parties to this Agreement, shall be settled and adjusted according to the present Plan established by the Building and Construction Trades Department, or any other plan or method of procedure that may be

adopted in the future by the Building and Construction Trades Department. Decisions rendered shall be final, binding and conclusive on the Contractor and Union parties to this Agreement.

- 6.4.1 For the convenience of the parties, and in recognition of the expense of travel between Northern California and Washington, D.C., at the request of any party to a jurisdictional dispute under this Agreement, an Arbitrator shall be chosen by the procedures specified in Article V, Section 5, of the Plan from a list composed of John Kagel, Thomas Angelo, Robert Hirsch and Thomas Pagan, and the Arbitrator's hearing on the dispute shall be held at the applicable Building and Construction Trades Council. All other procedures shall be as specified in the Plan.
- 6.5 All jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage, or slow-down of any nature, and the Contractor's assignment shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge.
- 6.6 Each Contractor shall conduct a Pre-Job Conference with the Council prior to commencing Covered Work. The Prime Contractor, the County and the Coordinator will be advised in advance of all such conferences and may participate if they wish. Pre-job conferences for different Contractors may be held together.

## ARTICLE 7

### PRE-JOB CONFERENCE

- 7.1 A mandatory Pre-Job Conference with each Contractor will be held prior to the commencement of work to establish the scope of work in each Contractor's contract. When a contract has been let to Contractors covered by this Agreement, a Pre-Job Conference and/or Mark-Up Meeting shall be required and shall be held. The parties may mutually agree to waive the requirement to hold a Pre-Job Conference and/or Mark-Up Meeting for any particular contract or contractor. All meetings shall be held at the offices of the Alameda County Building and Construction Trades Council.
- 7.2 The Contractor performing the work shall have the responsibility for making work assignments in accordance with Section 6.3 of this Agreement, and will be required to bring relevant plans, specifications, and blueprints to the meeting, as requested by Union.
- 7.3 The Coordinator will schedule and attend all Pre-Job and Mark-Up Meetings and participate in discussions as they pertain to the terms and conditions of this Agreement.

## ARTICLE 8

### JOINT ADMINISTRATIVE COMMITTEE MEETINGS

- 8.1 The parties to this Agreement will form a five person Joint Administrative Committee (JAC). The Committee will be comprised of two (2) representatives selected by the Council, two (2) representatives selected by the County, and one (1) community representative, nominated by the Board of Supervisors and agreeable to the Council. The parties shall appoint an alternate. The JAC meetings will be convened by the Coordinator and chaired jointly by a representative of the Council and the County, and a quorum shall be three members, including at least one (1) from the County and one (1) from the Council. The purpose of these meetings is to promote harmonious labor/management relations, ensure adequate communications and advance the proficiency and efficiency of the employees and the Contractors for the Covered Projects. The Committee shall also monitor compliance with Article 17 and Article 18. These meetings will also include discussion of the scheduling, productivity and safety of work performed for the Covered Projects.
- 8.2 The JAC shall appoint a Joint Administrative Subcommittee, comprised of one (1) representative of the County and, one (1) representative of the Council for the purpose of convening to confer in an attempt to resolve any grievance that has been filed consistent with Article 23. This Subcommittee shall meet as required to resolve grievances by consensus vote. If no resolution can be mutually agreed upon, the grievance shall proceed to the grievance procedure outlined in Article 23, Step 4.
- 8.3 The JAC shall appoint a Joint Administrative Subcommittee, comprised of one (1) representative of the County, one (1) representative of the Council and one (1) representative of a community based organization to resolve any grievance filed consistent with Article 17 or Article 18.
- 8.4 The JAC shall have the initial authority to investigate and resolve by consensus vote any allegation of violations of Articles 19 and 20. If the JAC cannot resolve the allegations, then any signatory party may take the matter directly to final and binding arbitration as described in Article 23.
- 8.5 JAC Meetings
- 8.5.1 The JAC will meet monthly at the call of either chair.
- 8.5.2 The Coordinator will establish agenda topics with input from the Committee and send notices of meetings with the agenda in advance of the meetings.
- 8.5.3 The JAC will receive reports and consider work progress and practices, local hire utilization, Disadvantaged Population utilization, pre-apprentice recruitment, training and referral, and apprentice development and utilization.
- 8.5.4 The Coordinator and the Contractors shall report progress on these issues and provide ongoing workforce projections for their work.

8.6 Joint Administrative Subcommittee Meetings

8.6.1 Both Joint Administrative Subcommittees will meet as required to address grievances/disputes.

8.6.2 The Coordinator will establish agenda topics with input from the Subcommittee and send notices of meetings with the agenda in advance of the meetings.

**ARTICLE 9**

**COORDINATOR**

9.1 The County will designate a Coordinator, who will be responsible for the administration and application of this Agreement.

9.2 The Coordinator shall endeavor to facilitate harmonious relations between the Contractors and Unions Signatory hereto and will conduct the Joint Administrative Committee meeting at the request of either joint chair referred to in Article 8 above. The Coordinator shall not be responsible for the acts of the Contractors or Unions Signatory hereto, and will not be a party to any arbitration or litigation arising out of this Agreement.

**ARTICLE 10**

**UNION RECOGNITION AND REPRESENTATION**

10.1 The Contractors recognize the Union(s) Signatory hereto as the sole and exclusive collective bargaining representatives for all craft employees on the Project.

10.2 All employees who are employed by the Contractors shall, as a condition of employment, on or before the eighth (8<sup>th</sup>) day of consecutive or cumulative employment for a construction contract subject to this Agreement, be responsible for the payment of the applicable monthly working dues and any associated fees uniformly required for union membership in the Union(s). However, there is nothing in this Agreement that would prevent non-union employees from joining the Union(s).

10.3 Authorized representatives of the Union(s) shall have access to the Project site at all times when work is being, has been or will be performed. Such representatives shall comply with the reasonable visitor safety and security rules established for the Project. Access for Union(s) representatives will not be unduly restricted.

10.4 The treatment and payment of stewards shall be in accordance with the applicable MLA.

## ARTICLE 11

### NO STRIKES - NO LOCKOUTS

- 11.1 During the life of this Agreement, the Unions and their members, agents, representatives and employees shall not incite, encourage, condone or participate in any strike, walkout, slowdown, sit-down, stay-in, boycott, wobble, sympathy strike, picketing or other work stoppage or hand-billing on the Covered Projects for any cause whatsoever, or any other type of interference of any kind, coercive or otherwise, and it is expressly agreed that any such action is a violation of this Agreement.
- 11.1.1 Withholding of employees for failure of a Contractor to meet its weekly payroll is not a violation of this Article 11; however, the Union shall submit documentation of the failure to pay to the Coordinator and shall give the affected Contractor and the Coordinator written notice seventy-two (72) hours prior to the withholding of employees.
- 11.1.2 Should a Contractor performing work for this Project be delinquent in the payment of Trust Fund contributions required under this Agreement with respect to employees represented by the Union, the Union may request, that the Contractor issue joint checks payable to the Contractor and the appropriate employee benefit Trust Fund until such delinquencies are satisfied. Any Trust Fund claiming that a Contractor is delinquent in its fringe benefit contributions to the funds will provide written notice of the alleged delinquency to the affected Contractor, with copies to the General Contractor, the Coordinator and the County. The notice will indicate the amount of delinquency asserted and the period that the delinquency covers. It is agreed, however, with respect to Contractors delinquent in trust or benefit contribution payments, that nothing in this Agreement shall affect normal contract remedies available under the local collective bargaining agreements. If the Contractor is delinquent in the payment of Trust Fund contributions for covered work performed for this Project, the Contractor agrees that the affected Trust Fund may place the County on notice of such delinquencies and the Contractor further agrees that the County may issue joint checks to the Contractor and the Trust Fund until the delinquency is satisfied.
- 11.2 Expiration of Local and Other Applicable Agreements. It is specifically agreed that there shall be no strike, sympathy strike, picketing, lockout, slowdown, withholding of work, refusal to work, walk-off, sick-out, sit-down, stand-in, wobble, boycott or other work stoppage of any kind as a result of the expiration of any local, regional or other applicable labor agreement having application on the Project and/or failure of the parties to that agreement to reach a new contract. If a Master Labor Agreement between a Contractor and the Union expires before the Contractor completes the performance of a construction contract and the Union or Contractor gives notice of demands for a new or modified Master Labor Agreement, the Union agrees that it will not strike or withhold labor from the Contractor for said contract for work covered under this Agreement and the Union

and the Contractor agree that the expired collective bargaining agreement shall continue in full force and effect for work covered under this Agreement until a new or modified Master Labor Agreement is reached between the Union and Contractor. If the Union and Contractors agree to an interim agreement that will apply until a new Master Labor Agreement is reached, then, the Contractor may work under the terms of the interim agreement until a new or modified Master Labor Agreement is reached between the Union and Contractor. If the new or modified Master Labor Agreement reached between the Union and Contractor provides that any terms of compensation of the Master Agreement shall be retroactive, the Contractor agrees to comply with any retroactive terms of the new or modified Master Labor Agreement to its effective date which is applicable to employees who performed work for the project during the interim period. Such compliance shall occur within seven (7) days after notification by the Union.

- 11.3 In consideration of the foregoing, the Contractor shall not incite, encourage or participate in any lockout or cause to be locked out any employee covered under the provisions of this Agreement. The term "lockout" does not refer to the discharge, termination or layoff of employees by the Contractor for any reasons in the exercise of its rights as set forth in any provision of this Agreement, nor does "lockout" include the County's or Contractor's decision to terminate or suspend work for the site or any portion thereof for any reason.
- 11.4 Any employee or employees inciting, encouraging or participating in any strike, slowdown, picketing, sympathy strike or other activity in violation of this Agreement may be subject to immediate discharge and the procedure under this Article 11, if invoked.
- 11.5 Upon written or electronic mail notice of a violation to the Local and/or International Union offices, the Union and its officers shall take immediate action and will use its (their) best efforts to prevent, end or avert any such aforementioned activity or the threat thereof by any of its officers, members, representatives or employees, either individually or collectively, including but not limited to, publicly disavowing any such action and ordering all such officers, representatives, employees or members who participate in such unauthorized activity to cease and desist from same immediately and to return to work and comply with its orders. The Contractor shall have the right, in the event of a work stoppage by the Union to replace the employees represented by the Union in violation of this Agreement. Nothing in this Agreement shall be construed to limit or restrict the right of any of the parties to this Agreement to pursue fully any and all remedies available under law in the event of a violation of this Article 11.
- 11.6 Any party to this Agreement may institute the following binding arbitration procedure when such a breach is alleged. In the event a party institutes this procedure, arbitration shall be mandatory.
  - 11.6.1 The party invoking this procedure shall immediately notify Robert Hirsch, who the parties agree shall be the permanent Arbitrator under this procedure. Thomas Angelo shall serve as alternate in the event that the permanent Arbitrator is unavailable at any time. Notice to the Arbitrator shall be by the most expeditious

means available, with written notice by email or similar means to the party alleged to be in violation and the involved Union General President.

- 11.6.2 Upon receipt of said notice the Arbitrator named above or the alternate shall designate a place for, schedule and hold a hearing within twenty-four (24) hours.
- 11.6.3 The Arbitrator shall notify the parties by electronic mail or similar means of the place and time chosen for the session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an award by the Arbitrator.
- 11.6.4 The sole issue at the hearing shall be whether or not a violation of this Article has in fact occurred, and the Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved for court or other arbitration proceedings, if any. The award shall be issued in writing within three (3) hours after the close of the hearing and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the award. The Arbitrator shall order cessation of the violation of this Article and other appropriate relief, and such award shall be served on all parties by hand or registered mail upon issuance.
- 11.6.5 Liquidated Damages. A party found to have violated the provisions of the No Strike-No Lockout section in this Article 11 shall cease such violation within eight (8) hours of the award of the Arbitrator. Should the violation continue past eight (8) hours, the party in violation shall pay to the affected party as liquidated damages either the actual damages incurred or the sum of ten thousand dollars (\$10,000.00) per shift, or portion thereof, whichever is greater, until such violation is ceased. The Arbitrator shall retain jurisdiction to resolve any disputes regarding the liquidated damages claimed under this section.
- 11.6.6 The award shall be final, binding and non-reviewable as to the merits. A judgment of any court of competent jurisdiction shall be entered upon the award, which may be enforced by any such court, upon the filing of this Agreement and all other relevant documents referred to hereinabove in the following manner. Electronic mail or similar notice of the filing of such enforcement proceedings shall be given to the other party. In the proceeding to obtain a temporary order enforcing the Arbitrator's award as issued under subsection 11.6.4 of this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Arbitrator's award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

- 11.6.7 Any rights created by statute or law governing arbitration or injunction proceedings inconsistent with the above procedure, or which interfere with compliance therewith, are hereby waived by the parties to whom they accrued.
- 11.6.8 The costs of the arbitration, including the fee and expenses of the Arbitrator, shall be borne equally by the affected Union(s) and the affected Contractors.
- 11.6.9 The procedures contained in this Section 11.6 shall be applicable only to alleged violations of this Article. Discharge or discipline of employees for violation of this Article shall be subject to the grievance and arbitration procedures of Article 23.

## ARTICLE 12

### MANAGEMENT RIGHTS

- 12.1 The Contractor retains full and exclusive authority for the management of their work forces for all work performed under this Agreement. This authority includes, but is not limited to, the right to:
  - 12.1.1 Plan, direct and control the operation of all the work.
  - 12.1.2 Decide the number and types of employees required to perform the work safely and efficiently. The lawful manning provisions of the applicable Master Collective Bargaining Agreement shall be recognized.
  - 12.1.3 Hire, promote and layoff employees as deemed appropriate to meet work requirements and/or skills required.
  - 12.1.4 Require all employees to observe the County's Project Rules, the Contractor's Project Rules, Security and Safety Regulations, consistent with the provisions of this Agreement. The Contractor's and County's Project Rules and Regulations shall be reviewed and mutually agreed upon at the Pre-Job meeting and supplied to all employees and/or posted on the jobsite.
  - 12.1.5 Discharge, suspend or discipline employees under the applicable MLA.
  - 12.1.6 Assign and schedule work at its sole discretion and determine when overtime will be worked consistent with this Agreement and the applicable MLA.
  - 12.1.7 Utilize any work methods, procedures or techniques and select and use any type or kind of materials, apparatus or equipment regardless of source, manufacturer or designator and in accordance with this Agreement, which covers the fabrication provisions and any other conflicts that are addressed in this Agreement.



- 12.2 The foregoing listing of management rights shall not be deemed to exclude other functions not specifically set forth herein. The Contractors, therefore, retain all legal rights not specifically enumerated in this Agreement.

### ARTICLE 13

#### WORK RULES

- 13.1 Work Rules shall be governed by the applicable MLA for each craft.

### ARTICLE 14

#### WAGE SCALES and FRINGE BENEFITS

- 14.1 All employees covered by this Agreement shall be classified and paid in accordance with the classification and wage scales contained in the appropriate MLAs which have been negotiated by the historically recognized bargaining parties and in compliance with the applicable general prevailing wage determination made by the Director of Industrial Relations pursuant to the California Labor Code.
- 14.2 For the duration of its work on this Project, the Contractors agree to recognize and put into effect such increases in wages and recognized fringe benefits as shall be negotiated between the various Union(s) and the historically recognized local bargaining parties on the effective date as set forth in the applicable MLA. The Union(s) shall notify the Contractors in writing of the specific increases in wages and recognized fringe benefits and the date on which they become effective.
- 14.3 The Contractors hereby adopt and agree to be bound by the written terms of the legally established Trust Agreements specifying the detailed basis on which payments are to be made into, and benefits paid out of, such appropriately qualified employee fringe benefit funds established by such appropriate Trust Agreements. The Contractors authorize the parties to such Trust Agreements to appoint Trustees and successor Trustees to administer the trust funds, and hereby ratify and accept the Trustees so appointed as if made by the Contractors.
- 14.4 If a Contractor fails to pay wages or benefits, the County agrees to honor a properly submitted, legally enforceable Stop Payment Notice.

## ARTICLE 15

### HOURS OF WORK, OVERTIME, SHIFTS and HOLIDAYS

- 15.1 The hours of work, establishment of overtime and the establishment of shifts and shift pay shall be governed by the applicable MLA for each craft and in accordance with the current General Prevailing Wage Determination made by the Director of Industrial Relations pursuant to the California Labor Code. It is understood that the County may, at its discretion, establish a uniform starting time and/or ending time.
- 15.2 Holidays and designated days off will be in compliance with the applicable General Prevailing Wage Determination made by the Director of Industrial Relations pursuant to the California Labor Code, unless otherwise set forth in the MLA.

## ARTICLE 16

### HEALTH AND SAFETY

- 16.1 The employees covered by the terms of this Agreement shall at all times, while in the employ of the Contractor, be bound by the safety rules and regulations as established by the County and Contractors and in accordance with OSHA/Cal-OSHA. These rules and regulations will be published and posted at conspicuous places throughout the Project site.
- 16.2 In accordance with the requirements of OSHA/Cal-OSHA, it shall be the exclusive responsibility of each Contractors working on the Project to assure safe working conditions for its employees and compliance by them with any safety rules contained herein or established by the Contractors or the County. Nothing in this Agreement shall in any way be construed to make the Union(s), the County, liable for safety violations on the Project.
- 16.3 The parties agree to abide by the substance abuse policies contained in the applicable MLA, subject to the Article 12. Should the County decide that there is a need for an OCIP on a Covered Project, the parties mutually agree to the side letter attached.

## ARTICLE 17

### LOCAL HIRING PROGRAM

- 17.1 The Parties agree to achieve the inclusion of Residents in the employment and apprenticeship opportunities created by the Covered Work, which will be known as the Local Hiring Program (LHP). With day-to-day support from the Coordinator, the Joint

Administrative Committee (JAC) formed pursuant to the provisions of Article 8 shall monitor the progress of the LHP and will serve as the central forum for representatives of all interested or affected parties to exchange information and ideas and to advise the County staff and the Coordinator concerning the operation and results of the LHP and the ongoing role of this Project Stabilization/Community Benefits Agreement as an integral component of LHP. As part of these responsibilities, the JAC will assess the obstacles to success of achieving inclusion of local Residents in the construction opportunities and shall make recommendations for a program to overcome some of those obstacles.

- 17.2 The parties agree to a goal that Residents of the County will perform up to 40 percent (40%) of all hours worked on all covered projects, on a craft-by-craft basis, if such workers are available, capable and willing to work on the projects, together with the apprentice goals established in Article 18, below.
- 17.3 The Contractors shall make good faith efforts to reach these goals, as described in Article 17.4 below and to reach these goals working through the normal hiring hall procedures listed in the MLA and the procedures identified in Article 18.4 and the County and Unions shall make good faith efforts to assist the Contractor in reaching this goal. In cases of alleged noncompliance, the issue may be referred to the Coordinator and then to the JAC for resolution. If the JAC can make no resolution, the issue may then be referred to Step 4 of Section 23.2.2 of the grievance procedure described in Article 14 for submission to an arbitrator for a final and binding determination. For purposes of resolution of any dispute arising under this Section or Article 18.4, the County shall be considered a party-in-interest with full right of participation in the arbitration proceeding.
- 17.4 The Contractors must take, and require their subcontractors to take, the following good faith steps to demonstrate that they have made every effort to reach the Local Hiring Goals:
- 17.4.1. The Contractors shall attend the scheduled pre-job meetings identified in Article 7. At this meeting, the Contractor must submit written workforce projections and projected man-hours on a craft-by-craft basis, consistent with the Contractor's bid proposal. In the event the pre-job meeting is waived, the Contractor must submit written workforce projections to the Coordinator within five (5) days.
- 17.4.2 Within one week of the issuance of the Notice to Proceed, the Contractors shall meet with the Coordinator to review and approve its compliance plan for reaching the Local Hiring Goals, using the required compliance plan form provided by the County.
- 17.4.3 The Contractors shall submit copies of hiring hall dispatch requests and responses to the Coordinator within ten (10) days of Coordinator's request at any point during the execution of the Project.
- 17.4.4 The Contractors shall immediately contact the Coordinator if a union hiring hall dispatcher will not or cannot, upon request of the Contractor, dispatch local

Residents.

- 17.4.5 The Contractors shall use the "Name Call," "Rehire" or other available hiring hall procedures to reach goals and shall provide documentation of such requests to the Coordinator upon request per subsection 17.4.3.
- 17.4.6 The Contractors shall use community based organizations as a resource for local labor resources, if a union will not or cannot provide local Residents as requested, and in conformity with the collectively bargained union hiring hall agreement.
- 17.4.7 The Contractors shall sponsor local Residents as defined herein for apprenticeship, when possible.
- 17.4.8 The Contractors shall maintain records for each Resident of Alameda County who was referred but not hired along with an explanation why the worker was not hired. Upon request, such records shall be made available for review by the County, Coordinator, and JAC for the duration of the Covered Projects.
- 17.4.9 The Contractors shall document participation in any local employment training programs and submit documentation of such to the Coordinator within ten (10) days if requested by Coordinator.
- 17.5 The Unions will exert their utmost efforts to recruit sufficient numbers of skilled craft persons who are Residents to fulfill the requirements of the Contractors. The parties to this Agreement support the development and placement of increased numbers of skilled construction workers from the Residents within the County to meet the needs of the covered project and the requirements of the industry generally.
- 17.6 To the extent possible, the parties agree to implement the Local Hiring Program while complying with the County's Local Vendor Preference and Enhanced Construction Outreach (ECOP) programs for the covered project. To the extent that the County determines, in its sole discretion, that there is a conflict between the Local Hiring Program established in this Agreement and the County's SLEB, ECOP, and/or Local Vendor Preference Programs, the conflict shall be resolved in favor of the Local Hiring Program on the construction work covered by this Agreement.
- 17.7 For the purposes of reaching the goal established in Article 17.2, a Contractor may qualify for full credit toward the goal by employing Alameda County Residents for other work the Contractor is performing in any of the nine Bay Area counties of: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Marin, Solano, Napa and Sonoma. Credit will only be given for work performed during the life of the Covered Project. In order to receive such credit, the Contractor must submit certified payrolls as documentation to the Coordinator. No credit for off-site work will be allowed until the Contractor has demonstrated a good faith effort to reach the goal on the Covered Projects and has received approval from the JAC.

## ARTICLE 18

### APPRENTICES

- 18.1 Recognizing the need to maintain continuing support of programs designed to develop adequate numbers of competent apprentice workers in the construction industry, the Contractors will make a good faith effort to employ apprentices in the respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured.
- 18.2 For the purpose of meeting the goals of this Article 18, the parties recognize State-approved apprenticeship training programs administered by Joint Labor/Management Apprenticeship Training Committees (JATC) as the sole source for an eighteen month trial period. If after the eighteen month trial period, it has been demonstrated that the JATCs are unable to provide sufficient Residents to meet the established goals, the parties to this agreement will meet to negotiate implementation strategies to meet the established goals. If resolution is not reached within six months, then the parties may refer the item to the grievance procedure as outlined in Article 23.
- 18.3 The Signatory parties agree that the County shall make available to the Unions a database of apprentices qualifying under the local hiring provisions of this Agreement. The Signatory Unions agree to report in accordance within any limits set by applicable labor law, the availability and dispatch/placement of qualifying apprentices. The reports will be submitted to the Coordinator on at least a quarterly basis and more often, if requested and possible.
- 18.4 For each Covered Project, the Contractors will be responsible to ensure that it and/or its subcontractors hire at least one (1) new apprentice for the first \$1 million of construction value and for each succeeding \$5 million of construction contract value, the Contractors and/or their subcontractors will be required to hire at least one (1) additional new apprentice. All such apprentices may be graduates of pre apprenticeship programs with a known and successful track record of apprentice placement into jobs. All the pre apprenticeship program graduates must be Residents of Alameda County and members of a Disadvantaged Population, as described in Article 1.
- 18.4.1. Contractors will make a good faith effort to maximize the project work hours for the new hire apprentices, and shall report those hours to the JAC, which will evaluate those good faith efforts.
- 18.4.2 Each Signatory Union will be responsible for dispatching/referring such County Residents to the contractor if they are available, capable and willing to work on the Covered Projects. No one trade can be used to satisfy the goal by the provision of more than two (2) such first stage apprentices, unless required by the nature of the work and or agreed upon by the JAC.

- 18.4.3 The Signatory Unions and Contractors shall exercise, to the extent of their authority, their best efforts to recruit apprenticeship program applicants from Residents and who are members of a Disadvantaged Population, as defined in Article 1. Further, for apprentices hired to comply with Article 18.4, there will be no limitation on where such apprentices will work subsequent to being hired for the Covered Projects. Contractors will be allowed to receive credit for Article 18.4 when utilizing apprentices for non-Project work during the life of the Covered projects, regardless of the location of the work as long as it is in the nine (9) Bay Area counties described in Article 18.4.5.
- 18.4.4 The Contractor shall request dispatch of apprentices in writing from the local Unions and/or Joint Apprenticeship Training Committee in which the Contractor participates. Copies of the written requests shall be provided to the Coordinator within ten (10) days of request by the Coordinator. The Unions shall honor all Contractor dispatch requests for such Apprentices.
- 18.4.5 For the purposes of meeting the goal established in Section 18.4, a Contractor may qualify for full credit toward the goal by employing Alameda County Residents as apprentices for other work the Contractor is performing in any of the nine Bay Area counties of: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Marin, Solano, Napa and Sonoma. Credit will only be given for work performed during the life of the Covered projects. In order to receive such credit, the Contractor must submit certified payrolls as documentation to the Coordinator. No credit for non-Covered Projects work will be allowed until the Contractor has demonstrated a good faith effort to reach the goal on the Covered projects and has received approval from the JAC.
- 18.5 The Unions will cooperate with the County, the Contractors, and the Coordinator in conducting outreach activities to recruit and refer qualified Alameda County Resident applicants to apprenticeship programs. In addition, the Unions will work with designated pre-apprenticeship programs to promote graduates and enhance their entry into the Apprenticeship programs.
- 18.6 To the extent permitted by law and the JATC requirements, the Unions will give credit to bona fide, provable past experience to applicants, including work for non-union Contractors who become signatory to the PS/CBA. The experience and practical knowledge of applicants will be reviewed and tested by the applicable Joint Apprenticeship Training Committee. Applicants will be placed at the appropriate stage of apprenticeship or journey level as the case may be. Final decisions will be the responsibility of the applicable Joint Apprenticeship Training Committee.

## ARTICLE 19

### REFERRAL PROCESS

- 19.1 The Union(s) shall be the primary source of all craft labor employed on the Project. However, in the event that a Contractor has its own core workforce, the Contractors may request by name, and the Union(s) shall honor, referral of persons who have applied to the local union for Project work and who demonstrate the following qualifications ("Core Employees"):
- 19.1.1 possess any license and/or certifications required by state or federal law for the Project work to be performed;
  - 19.1.2 have worked a total of at least one thousand (1,000) hours in the construction craft during the prior three (3) years;
  - 19.1.3 were on the Contractors' active payroll for at least sixty (60) out of the one hundred forty (140) calendar days prior to the contract award; and
  - 19.1.4 have the ability to perform safely the basic functions of the applicable trade.
  - 19.1.5 be a resident of Alameda County at least six months prior to the hire date.
- 19.2 In the case of a Sole Proprietor/Owner Operator that is self-performing work, this Sole Proprietor/Owner Operator is not required to request a dispatch from the union hall. Sole Proprietors/Operators must be certified as such by some public agency acceptable to the County and the affected signatory unions. If the Sole Proprietor/Owner Operator hires employees subsequent to starting work on Covered Projects, all such employees would need to be requested from the union hall as described in subsection 19.3 below
- 19.3 The Union(s) will first refer to such Contractors one journeyman employee from the hiring hall out-of-work list for the affected trade or craft, and will thereafter refer one of such Contractors' "core" employees as a journeyman and shall repeat the process, one and one, until such Contractors' crew requirements are met or until such Contractors have hired no more than five (5) Core Employees, whichever occurs first. Thereafter, all additional employees shall be hired exclusively from the Union(s)' hiring hall out-of-work list(s). For the duration of the Contractors' work the ratio shall be maintained and when the Contractors' workforce is reduced, Employees shall be laid off in the same ratio of core employees to hiring hall referrals as was applied in the initial hiring. Contractors signatory to a Local, Regional, and/or National collective bargaining agreement(s) with Signatory Union(s) hereto shall be bound to use the hiring hall provisions contained in the relevant MLA of the affected Union(s), and nothing in the referral provisions of this Agreement shall be construed to supersede the local hiring hall provisions of the MLAs as they relate to such Contractors.

- 19.4 For purposes relating to "Owner/Operators" used for the hauling of workers and materials, including water or oil. It is agreed that the Owner/Operator doing such hauling work may be dispatched to the job first (as a core employee) provided that such Owner/Operator has complied with and completed all registration requirements with the Union prior to dispatch.
- 19.5 All Contractors shall be bound by and utilize the registration facilities and referral systems established or authorized by the Signatory Union(s) so long as such procedures are in compliance with applicable federal, state or local law. The Contractor shall have the right to determine the competency of all employees and may reject any referral for any reason, provided that the Contractor complies with Article 22, Non-Discrimination, and in accordance with the applicable MLA.
- 19.6 In accordance with the Master Labor Agreement and in the event that referral facilities maintained by the Union(s) are unable, despite good faith efforts, to fill the request of a Contractor for employees within a forty-eight (48) hour period after such request is made by the Contractor, Saturdays, Sundays and Holidays excluded, the Contractor shall be free to obtain work persons from any source ("Alternative Employees"). Upon hiring Alternative Employees, the Contractor shall immediately notify the appropriate Union(s) of the name and address of the Alternative Employees hired, which Alternative Employees shall be bound by the provisions of this Article and the Union(s)' hiring hall rules.
- 19.7 The Union(s) will exert their utmost efforts to recruit sufficient numbers of skilled craft persons to fulfill the requirements of the Contractors. The parties to this Agreement support the development of increased numbers of skilled construction workers from the Residents of Alameda County to meet the needs of the Project and the requirements of the industry generally. Accordingly, contingent upon request by the Contractor, the Unions agree to encourage the referral and utilization of Residents as journeyman and apprentices on the Project and the entrance of Residents into apprenticeships and training programs, as long such Residents possess the requisite skills and qualifications.

## ARTICLE 20

### DATA COLLECTION AND REPORTING

- 20.1 This article describes data collection, reporting guidelines and responsibilities for parties signatory to the PSCBA.
- 20.2 The County shall be responsible for collecting and maintaining accurate data on the availability of the Disadvantaged Population Residents available, capable and willing to work on Projects. This data will be made available and accessible to the Union.
- 20.3 On a monthly basis, Contractors must submit reports on the status and progress of local hiring on a craft by craft basis, including utilization of apprentices.



- 20.4 The signatory Unions agree to report in accordance with any limits set by applicable labor law, the availability and dispatch/placement of apprentices. These reports will be submitted to the Coordinator on at least a quarterly basis and more often, if requested and possible.
- 20.4.1 In advance of pre-job meetings, the Union shall assist the Coordinator with developing a current list of Disadvantaged Population first stage apprentices available to work on the project.
- 20.4.2 At pre-job meetings, the Coordinator shall supply contractors with a current list of Disadvantaged Population apprentices and their status of completion of their apprenticeship.
- 20.4.3 On a quarterly basis, the Union shall provide the County and Coordinator a report on the status of Disadvantaged Population apprentices, including but not limited to their placement and advancement
- 20.5 On an annual basis, the Union, County and Coordinator shall provide a report for the Board of Supervisor's review as described and required in Article 27.1. This report shall include but not be limited to the local hiring and apprentice goal performance, as well as challenges and benefits of the PSCBA.

## ARTICLE 21

### HELMETS TO HARDHATS: VETERAN EMPLOYMENT

- 21.1 The Contractors and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the Contractors and the Unions.
- 21.2 The Unions and Contractors agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on the Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.
- 21.3 The Contractors may also utilize the services of the "Swords to Ploughshares" program.

## ARTICLE 22

### NON-DISCRIMINATION

- 22.1 The Unions and Contractors shall not discriminate against any employee or applicant for employment because of race, creed, color, sex, actual or perceived sexual orientation, national origin, age, religion, political affiliation, or membership or non-membership in labor organization union activity, military veteran status, and disability as identified in the Americans With Disabilities Act, or any other basis recognized by law.

## ARTICLE 23

### GRIEVANCE PROCEDURE

- 23.1 All disputes concerning the interpretation and/or application of this Agreement that do not fall within the Article 11 No-Strike/No-Lockout procedure, Article 6 Work Assignments and Jurisdictional Disputes, Article 17 Local Hiring Program, or Article 18 Apprentices, shall be governed by the following grievance and arbitration procedure.
- 23.2 Grievances between one or more Union(s) and one or more Contractor regarding interpretation and/or application of this Agreement shall be pursued according to the following provisions:
- 23.2.1 A grievance shall be considered null and void if not brought to the attention of the Contractors or the Union(s) within ten (10) working days after the grievance is alleged to have occurred but in no event more than thirty (30) days after the charging party became aware of the event giving rise to the dispute.
- 23.2.2 Grievances between one or more Union(s) and one or more Contractors regarding provisions of this Agreement shall be settled or otherwise resolved according to the following Steps and provisions:
- Step 1: The Contractors or the Union(s)' representative and the grievant shall attempt to resolve the grievance with the craft supervisor or Steward.
- Step 2: In the event the matter remains unresolved in Step 1 above, within five (5) working days, the grievance shall be reduced to writing and may then be referred by the Contractors or Union(s) to the grievant for discussion and resolution.
- Step 3: In the event that the representatives are unable to resolve the dispute within the five (5) working days after its referral to Step 2, either involved party may submit it within five (5) working days to the Joint Administrative Subcommittee, established in Section 10.2, which shall meet within five (5)

working days after such referral (or such longer time as is mutually agreed upon by the representatives on the Joint Administrative Subcommittee) to confer in an attempt to resolve the grievance. Regardless of which party has initiated the grievance proceeding, prior to the meeting of the Joint Administrative Subcommittee, the Union shall notify its international union representative(s), which shall advise both parties if it intends on participating in the meeting. The participation by the International Union Representative in this Step 3 meeting shall not delay the time set herein for the meeting, unless otherwise mutually agreed by the parties. Decisions by the Joint Administrative Subcommittee shall be by majority vote with such resolutions to be final and binding on all signatories of the Agreement. If the dispute is not resolved by the Joint Administrative Subcommittee, it may be referred within five (5) working days by either party to Step 4.

Step 4: In the event the matter remains unresolved in Step 3, either Party may request, within five (5) working days, that the dispute be submitted to arbitration. The time limits set out in this procedure may, upon mutual agreement, be extended. Any request for arbitration, request for extension of time limits, and agreement to extend such time limits shall be in writing.

Step 5: Within seven (7) calendar days after referral of dispute in Step 4, the parties shall choose an arbitrator for final and binding arbitration. The parties agree that an arbitrator shall be selected by the alternate striking method from the following list. The party who shall strike the first name shall be selected by the toss of a coin (1) Carol Isen (2) Barbara Kong-Brown (3) Thomas Angelo (4) Robert Hirsch (5) William Ricker. Should a Party to the procedure fail or refuse to participate in the hearing, if the Arbitrator determines that proper notice of the hearing has been given, said hearing shall proceed to a default award. The Arbitrator's award shall be final and binding on all Parties to the arbitration. The costs of the arbitration, including the arbitrator's fee and expenses, shall be borne equally by the Parties. The Arbitrator's decision shall be confined to the question(s) posed by the grievance and the Arbitrator shall not have authority to modify amend, alter, add to, or subtract from, any provisions of this Agreement.

23.3 Grievances raised by County against one or more Union(s) and/or the Building Trades Council, or against the County by one or more Union(s) and/or the Building Trades Council, regarding provisions of this Agreement, shall be settled or otherwise resolved according to the following Steps and provisions:

23.3.1. A grievance shall be considered null and void if not brought to the attention of the County or the Union(s) within ten (10) working days after the grievance is alleged to have occurred but in no event more than ten (10) days after the charging party became aware of the event giving rise to the dispute.

Step 1: The County/Union(s) Joint Administrative Subcommittee shall attempt to resolve the grievance. The County/Union(s) Joint Administrative Subcommittee shall meet within five (5) working days after receipt of the grievance (or such longer time as is mutually agreed upon by the representatives on this Joint Administrative Subcommittee) to confer with regard to the grievance. Decisions by the Joint Administrative Subcommittee shall be by majority vote with such resolutions to be final and binding on all signatories of the Agreement. If the dispute is not resolved by the Joint Administrative Subcommittee, within the five (5) working days after meeting on the grievance, either involved party may proceed to Step 2.

Step 2: In the event the matter remains unresolved pursuant to Step 2, either Party may request that the dispute be submitted to arbitration. The time limits set out in this procedure may, upon mutual agreement, be extended. Any request for arbitration, request for extension of time limits, and agreement to extend such time limits shall be in writing.

Step 3: Within seven (7) calendar days after referral of dispute in Step 2, the parties shall choose an arbitrator for final and binding arbitration. The parties agree that an arbitrator shall be selected by the alternate striking method from the following list. The party who shall strike the first name shall be selected by the toss of a coin (1) Carol Isen (2) Barbara Kong-Brown (3) Thomas Angelo (4) Robert Hirsch (5) William Ricker. Should a Party to the procedure fail or refuse to participate in the hearing, if the Arbitrator determines that proper notice of the hearing has been given, said hearing shall proceed to a default award. The Arbitrator's award shall be final and binding on all Parties to the arbitration. The costs of the arbitration, including the arbitrator's fee and expenses, shall be borne equally by the Parties. The Arbitrator's decision shall be confined to the question(s) posed by the grievance and the Arbitrator shall not have authority to modify amend, alter, add to, or subtract from, any provisions of this Agreement.

23.4 Where an issue is addressed in this Agreement and an MLA, this Agreement shall prevail. Where an issue is addressed in an MLA and not in this Agreement, the MLA shall control.

23.5 Grievances between a Union(s) and a Union(s)' signatory contractor involving interpretation or application of the Master Agreement shall be governed by the grievance procedures contained in the Master Agreement.

## ARTICLE 24

### MISCELLANEOUS PROVISIONS

- 24.1 Counterparts. This Agreement may be executed in counterparts, such that original signatures may appear on separate pages, and when bound together all necessary signatures shall constitute an original. Facsimile signature pages transmitted to other parties to this Agreement shall be deemed equivalent to original signatures.
- 24.2 Warranty of Authority. Each of the persons signing this Agreement represents and warrants that such person has been duly authorized to sign this Agreement on behalf of the party indicated, and each of the parties by signing this Agreement warrants and represents that such party is legally authorized and entitled to enter into this Agreement.
- 24.3 Ratification by Governing Board. This Agreement shall not be binding on the County until it is ratified by the Board of Supervisors.

## ARTICLE 25

### ENTIRE AGREEMENT

- 25.1 This Agreement represents the complete understanding of the parties. The provisions of this Agreement, including the MLAs, shall in every instance exclusively apply to and control work performed on the Project. The provisions of this Agreement shall take precedence over provisions of local, area, regional or national labor agreements. Nothing contained in the MLAs, working rules, by-laws, constitution and other similar documents of the Unions, shall in any way affect, modify or add to this Agreement unless otherwise specifically indicated in this Agreement or mutually agreed to in writing and executed by the parties. Practices not part of the terms and conditions of this Agreement shall not be recognized.
- 25.2 The Unions agree that this Agreement covers all matters affecting wages, hours and other terms and conditions of employment, and that during the terms of this Agreement, neither the Contractors, nor the Unions will be required to negotiate on any further matters affecting these or any other subject not specifically set forth in this Agreement except by mutual agreement of the Unions involved and the County.
- 25.3 The parties to this Agreement understand and agree that nothing in this Agreement shall supersede or take precedence over any Board policy or requirement including, but not limited to, the construction contract, contract documents, project manual, and general conditions for the Project.
- 25.4 Provisions negotiated into any new or modified MLA which are less favorable to the Contractor shall not apply to work covered by this Agreement. Any disagreement between the parties regarding the application of the provisions of any new or modified

MLA shall be resolved under the dispute and grievance arbitration procedures set forth in Article 23.

- 25.5 This Agreement may be executed in counterparts, such that the original signatures may appear on separate pages and when bound together all necessary signatures shall constitute an original. Facsimile signature pages transmitted to other parties to this Agreement shall be deemed the equivalent to original signatures.

## ARTICLE 26

### GENERAL SAVINGS CLAUSE

- 26.1 It is not the intention of the parties to violate any laws governing the subject matter of this Agreement. If any Article or provision of this Agreement shall be declared invalid, inoperative, or unenforceable by any competent authority of the executive, legislative, judicial or administrative branch of the federal, state or local government, the parties shall suspend the operation of each such article or provision during the period of invalidity. Such suspension shall not affect the operation of any provision covered in this Agreement to which the law or regulation is not applicable. Further, parties agree that if and when any or all provisions of this Agreement are finally held or determined to be illegal or void by a Court of competent jurisdiction, the parties will promptly enter into negotiations concerning the substance affected by such decision for the purpose of achieving conformity with the requirements of an applicable law and the intent of the parties hereto.

## ARTICLE 27

### DURATION OF AGREEMENT

- 27.1 This Agreement shall become effective on the day the County Board of Supervisors ratifies this Agreement and shall continue in full force and effect for 3 years. In the event that either party wishes to amend, modify or otherwise alter this Agreement at the end of three (3) years, written notice shall be delivered between sixty (60) and thirty (30) days prior to expiration. If neither party provides said written notice, this Agreement shall remain in effect for an additional two (2) years. At the end of a total of five (5) years, if parties so desire they may enter negotiations for a new Agreement or an extension to be determined. There shall be an annual report with a presentation to the County Board of Supervisors prepared by the General Services Agency in collaboration with other applicable County Departments.

**SIGNATURES**

**County of Alameda**

By: \_\_\_\_\_  
President, Board of Supervisors

Approved as to Form:  
Donna R. Ziegler, County Counsel

By: Carey Baman  
Deputy County Counsel

**Building & Construction Trades Council of Alameda County:**

By: Andreas Cluver  
Andreas Cluver, Secretary-Treasurer

**Signatory Unions:**

**Asbestos Workers, Local 16**

By: Phil Berman

**Boilermakers, Local 549**

By: Michael D. [Signature]

**Bricklayers & Allied Craftsmen, Local 3**

By: Steve [Signature]

**Northern California Carpenters  
Regional Council (on behalf of Carpenters,  
Local 713, Carpenters, Local 2236, Lathers,  
Local 68L, Millwrights, Local 102,  
Pile Drivers, Local 34)**

By: [Signature]

Cement Masons, Local 300

By: [Signature]

Electrical Workers, Local 595

By: [Signature]

Elevator Constructors, Local 8

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

Hod Carriers, Local 166

By: [Signature]

Iron Workers, Local 378

By: [Signature]

Laborers, Local 67

By: [Signature]

Laborers, Local 304

By: [Signature]

Operating Engineers, Local 3

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

Plasterers, Local 66

By: [Signature]

Roofers, Local 81

By: [Signature]

Sheet Metal Workers, Local 104

By: [Signature]

Sign Display, Local 510

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

Sprinkler Fitters, Local 483

By: [Signature]

Teamsters, Local 853

By: [Signature]

United Association of Journeymen and  
Apprentices Fitting Industry, Underground  
Utility & Landscape, Local 355

By: [Signature]



Cement Masons, Local 300	By: _____
Electrical Workers, Local 595	By: <u>John K. Chen</u>
Elevator Constructors, Local 8	By: _____
Hod Carriers, Local 166	By: <u>Earl Nelson</u>
Iron Workers, Local 378	By: <u>John P. Green</u>
Laborers, Local 67	By: <u>John P. Green</u>
Laborers, Local 304	By: <u>Fernando Estrada</u>
Operating Engineers, Local 3	By: _____
Plasterers, Local 66	By: _____
Roofers, Local 81	By: <u>Douglas Ziegler</u>
Sheet Metal Workers, Local 104	By: <u>Tom Wood</u>
Sign Display, Local 510	By: <u>Joseph B. Toback</u>
Sprinkler Fitters, Local 483	By: _____
Teamsters, Local 853	By: _____
United Association of Journeymen and Apprentices Fitting Industry, Underground Utility & Landscape, Local 355	By: <u>Miguel Duran</u>

United Association of Steamfitters,  
Pipefitters, Plumbers, & Gas  
Fitters, Local 342

By: Michael Hernandez

District Council No. 16 Northern  
California International Union of  
Painters & Allied Trades (on behalf of  
Auto & Marine Painters, Local 1176,  
Carpet & Linoleum Layers, Local 12,  
Glaziers, Architectural Metal  
& Glassworkers, Local 169,  
Painters & Tapers, Local 3

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

**EXHIBIT A** (Letter of Assent)

**PROJECT STABILIZATION/COMMUNITY BENEFITS AGREEMENT**

for the

**COUNTY OF ALAMEDA  
CONTRACTOR AGREEMENT TO BE BOUND**

The undersigned, as a Contractor or Subcontractor (CONTRACTOR) on the County of Alameda, (hereinafter PROJECTS), for and in consideration of the award to it of a contract to perform work on said PROJECTS, and in further consideration of the mutual promises made in the "Project Stabilization/Community Benefits Agreement for the County of Alameda Project" (hereinafter AGREEMENT), a copy of which was received and is acknowledged, hereby:

- (1) Accepts and agrees to be bound by the terms and conditions of the AGREEMENT, together with any and all amendments and supplements now existing or which are later made thereto;
- (2) The CONTRACTOR agrees to be bound by the legally established local trust agreements as set forth in Article 14 of this AGREEMENT.
- (3) The CONTRACTOR authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the CONTRACTOR;
- (4) Certifies that it has no commitments or agreements which would preclude its full and complete compliance with the terms and conditions of said AGREEMENT.
- (5) Agrees to secure from any CONTRACTORS (as defined in said AGREEMENT) which is or becomes a Subcontractor (of any tier) to it, a duly executed Agreement to be Bound in form identical to this document.

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

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Name of Prime Contractor or Higher  
Level Subcontractor)

\_\_\_\_\_  
(Authorized Officer & Title)

**CA Number** \_\_\_\_\_

\_\_\_\_\_  
(Address)

Contract Or Project # \_\_\_\_\_

\_\_\_\_\_  
(Phone)

\_\_\_\_\_  
(Fax)

**MEMORANDUM OF UNDERSTANDING**

**COUNTY OF ALAMEDA  
PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT**

Notwithstanding any provision to the contrary in the County of Alameda Project Stabilization/Community Benefit Agreement ("Project Stabilization Agreement"), this memorandum will confirm that work covered by the Project Stabilization/Community Benefits Agreement within the craft jurisdiction of the Elevator Constructors will be performed under the terms of the National Agreement of the International Union of Elevator Constructors, except that Articles 6,11 and 23 of the Project Stabilization Agreement will apply to such work.

County of Alameda

INTERNATIONAL UNION OF  
ELEVATOR CONSTRUCTORS  
LOCAL UNION NO. 8

\_\_\_\_\_  
President, Board of Supervisor

Eric W. McCloud

Date \_\_\_\_\_

Date 5-20-2013

Approved as to Form:

Donna R. Ziegler, County Counsel

By: Quarrey Beaman  
Deputy County Counsel

**MEMORANDUM OF UNDERSTANDING**

**COUNTY OF ALAMEDA  
PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT**

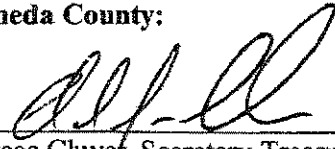
In the event the County decides to cover any given Project with an Owner Controlled Insurance Program (OCIP) during the life of the PS/CBA, the following language will apply:

The County intends to implement an OCIP, or wrap up insurance, on the Project. All Contractors and employees performing work on the Project, and not otherwise excluded from the OCIP; will be bound by the requirement of the OCIP Safety Manual; provided however, discipline imposed for alleged violations of the OCIP Safety Manual is subject to the Grievance procedures in Article 23. Any drug testing protocol established by the Contractor for the Project shall satisfy the requirements of the OCIP Safety Manual and be consistent with the MLAs. In the event that there is a conflict between the MLAs and the OCIP requirements, the OCIP requirements shall prevail.

**County of Alameda**

**Building & Construction Trades Council of  
Alameda County:**

By: \_\_\_\_\_  
President, Board of Supervisor

By:   
Andreas Cluver, Secretary-Treasurer

Date \_\_\_\_\_

Date 5/21/13

**Approved as to Form:**  
Donna R. Ziegler, County Counsel

By: \_\_\_\_\_  
Deputy County Counsel

**MEMORANDUM OF UNDERSTANDING**

**COUNTY OF ALAMEDA  
PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT**

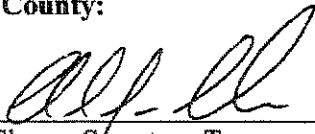
The parties agree that the PLA to which this letter is addended shall not apply to any contracts entered into by the Alameda County Public Works Agency for a period of three years from the effective date of the PLA, except that any and all trucking, as described in Article 5.4 of said PLA, shall be covered by the PLA.

Any disputes concerning the interpretation and or application of this side letter shall be subject to the dispute resolution process set forth in Article 23 of the PLA.

**County of Alameda**

**Building & Construction Trades Council of  
Alameda County:**

By: \_\_\_\_\_  
President, Board of Supervisor

By:  \_\_\_\_\_  
Andreas Cluver, Secretary-Treasurer

Date \_\_\_\_\_

Date 5/21/13

**Approved as to Form:**  
Donna R. Ziegler, County Counsel

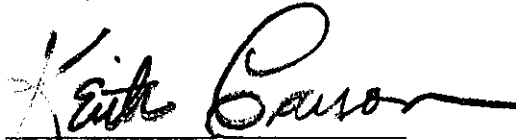
By: \_\_\_\_\_  
Deputy County Counsel

**MEMORANDUM OF UNDERSTANDING**

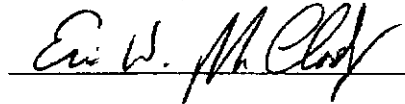
**COUNTY OF ALAMEDA  
PROJECT STABILIZATION/COMMUNITY BENEFIT AGREEMENT**

Notwithstanding any provision to the contrary in the County of Alameda Project Stabilization/Community Benefit Agreement ("Project Stabilization Agreement"), this memorandum will confirm that work covered by the Project Stabilization/Community Benefits Agreement within the craft jurisdiction of the Elevator Constructors will be performed under the terms of the National Agreement of the International Union of Elevator Constructors, except that Articles 6,11 and 23 of the Project Stabilization Agreement will apply to such work.

County of Alameda

  
President, Board of Supervisor

INTERNATIONAL UNION OF  
ELEVATOR CONSTRUCTORS  
LOCAL UNION NO. 8



Date 1 JUN 11 2013

Date 5-20-2013

**Approved as to Form:**

Donna R. Ziegler, County Counsel

By:   
Deputy County Counsel

## HAZARDOUS MATERIALS PROCEDURES & REQUIREMENTS

### 1. Summary

This document includes information applicable to hazardous materials and hazard waste abatement.

### 2. Notice of Hazardous Waste or Materials Conditions

- 2.1. Contractor shall give notice in writing, including by e-mail, to the County, the Construction Manager, and the Architect promptly, before any of the following conditions are disturbed, and **in no event later than twenty-four (24) hours after first observance**, of any:
  - 2.1.1. Material that Contractor believes may be material that is hazardous waste or hazardous material, as defined in section 25117 or 25260 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;
  - 2.1.2. Other material that may present a substantial danger to persons or property exposed thereto in connection with Work at the site.
- 2.2. Contractor's written notice shall indicate whether the hazardous waste or material was shown or indicated in the Contract Documents to be within the scope of Work, and whether the materials were brought to the site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible. As used in this section the term "hazardous materials" shall include, without limitation, asbestos, lead, mercury, Polychlorinated biphenyl (PCB), petroleum and related hydrocarbons, and radioactive material.
- 2.3. In response to Contractor's written notice, the County shall investigate the identified conditions.
- 2.4. If the County determines that conditions do not involve hazardous materials or that no change in terms of Contract is justified, the County shall so notify Contractor in writing, stating reasons. If the County and Contractor cannot agree on whether conditions justify an adjustment in Contract Price or Contract Times, or on the extent of any adjustment, Contractor shall proceed with the Work as directed by the County.
- 2.5. If after receipt of notice from the County, Contractor does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume Work under special conditions, then County may order such portion of Work that is in connection with such



hazardous condition or such affected area to be deleted from the Work, or performed by others, or County may invoke its rights to terminate the Contract in whole or in part. County will determine entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of Work, or performing the Work by others.

- 2.6. If Contractor stops Work in connection with any hazardous condition and in any area affected thereby, Contractor shall immediately redeploy its workers, equipment, and materials, as necessary, to other portions of the Work to minimize delay and disruption.

### **3. Additional Warranties and Representations**

- 3.1. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training, and ability to comply fully with all applicable law and contract requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to address adequately the actual or potential dangers of Contract performance).
- 3.2. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state, and other governmental and quasi-governmental requirements applicable to the Work.
- 3.3. Contractor represents and warrants that it has studied carefully all requirements of the Specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in the Contract, and prior to submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed Project in full compliance with the Contract Documents.

### **4. Monitoring and Testing**

- 4.1. County reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, Work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor Contract requirements of safe and statutorily compliant work methods and (where applicable) safe re-entry level air standards under state and federal law upon completion of the job, and compliance of the work with periodic and final inspection by public and quasi-public entities having jurisdiction.

- 4.2. Contractor acknowledges that County has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement, and post-abatement air monitoring, that County shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event County elects to perform these activities and tests, Contractor shall afford County ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these activities or tests by County in the Contract Price and the Scheduled Completion Date.
- 4.3. Notwithstanding County's rights granted by this paragraph, Contractor may retain its own industrial hygiene consultant at Contractor's own expense and may collect samples and may perform tests including, but not limited to, pre-abatement, during abatement, and post-abatement personal air monitoring, and County reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work and Contractor shall immediately provide that documentation upon request.

## **5. Compliance with Laws**

- 5.1. Contractor shall perform safe, expeditious, and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal, and disposal industry, the applicable law, and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.
- 5.2. Contractor represents that it is familiar with and shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work relating to:
- 5.2.1. The protection of the public health, welfare and environment;
- 5.2.2. Storage, handling, or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;
- 5.2.3. The generation, processing, treatment, storage, transport, disposal, destruction, or other management of asbestos, PCB, lead, petroleum, or hazardous waste materials or other waste materials of any kind; and
- 5.2.4. The protection of environmentally sensitive areas such as wetlands and coastal areas.

## **6. Disposal**

- 6.1. Contractor has the sole responsibility for determining current waste storage, handling, transportation, and disposal regulations for the job Site and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable law. County may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.
- 6.2. Contractor shall develop and implement a system acceptable to County to track hazardous waste from the Site to disposal, including appropriate "Hazardous Waste Manifests" on the EPA form, so that County may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.
- 6.3. Contractor shall provide County with the name and address of each waste disposal facility prior to any disposal, and County shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which County has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the County.

## **7. Permits**

- 7.1. Before performing any of the Work, and at such other times as may be required by applicable law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to County that it and any disposal facility:
  - 7.1.1. have obtained all required permits, approvals, and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable law, and
  - 7.1.2. are in compliance with all such permits, approvals and the regulations.

For example, before commencing any work in connection with the Work involving asbestos-containing materials, or PCBs, or other hazardous materials subject to regulation, Contractor agrees to provide the required Notice of Intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to County. Contractor shall not conduct any Work involving asbestos-containing materials or PCBs unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, and bonds that are required by governmental or quasi-governmental authorities, and all fees, deposits, tap fees, offsite easements, and asbestos and PCB disposal facilities expenses necessary for the prosecution of the Work, shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the all applicable laws bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have

observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying County in writing, including by e-mail, of such fact. If Contractor performs any Work contrary to applicable laws, it shall bear all costs arising therefrom.

- 7.2. In the case of any permits or notices held in County's name or of necessity to be made in County's name, County shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for County review and execution upon approval, all necessary applications, notices, and other materials.

## **8. Indemnification**

- 8.1. To the extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement, and disposal of hazardous waste. This includes, but is not limited to, liabilities connected to the selection and use of a waste disposal facility, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. § 9601 et seq.).

## **9. Termination**

- 9.1. County shall have an absolute right to terminate for default immediately without notice and without an opportunity to cure should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents, or any applicable law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional, and non-reckless failure to exercise reasonable care, then the procedures for termination for cause shall apply without modification.

END OF DOCUMENT

DOCUMENT 01 10 00

**SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents must be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions Document 00 72 13
- B. Special Conditions Document 00 73 13A
- C. Construction Waste Management Document 01 74 19
- D. LEED™ Requirements Document 01 35 13.23
- E. Section intentionally omitted

**1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of this Contract consists of the following:

As the needs of the agency have evolved over time, it has been determined that a few additional private offices, an additional conference room, a small storage room, and an expanded phone/data room would best suit its current and trending needs. Electrical and technology infrastructure upgrades will also be required to support the new spaces and staff.

**1.03 CONTRACTS**

- A. Perform the Work under a single, fixed-price Contract.
- B. Any bid item may be deleted in total or in part prior to or after award of Contract without compensation in any form or adjustment of other bid items or prices.

**1.04 WORK BY OTHERS**

- A. Work on the Project that will be performed and completed prior to the start of the Work of this Contract:
  - (1) Asbestos removal/abatement, however, the County Project Manager must be contacted in advance of any roof penetration to address the potential of asbestos in the existing roofing mastic.
  - (2) Lead paint removal/abatement.

- B. Work on the Project that will be performed by others concurrent with the Work of this Contract:

- (1) Upgrade of the phone/data cabling to Cat6 by E-3 Systems.

#### **1.05 CODES, REGULATIONS, AND STANDARDS**

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the County and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

#### **1.06 PROJECT RECORD DOCUMENTS:**

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
  - (1) Contract Drawings.
  - (2) Specifications.
  - (3) Addenda.
  - (4) Change Orders and other modifications to the Contract.
  - (5) Reviewed shop drawings, product data (including MSDS), and samples.
  - (6) Field test records.
  - (7) Inspection certificates.
  - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
- C. Contractor shall record information concurrent with construction progress.

- D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
- (1) Manufacturer's name and product model and number.
  - (2) Product substitutions or alternates utilized.
  - (3) Changes made by Addenda and Change Orders and written directives.

#### 1.07 EXAMINATION OF EXISTING CONDITIONS

- A. The Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site or of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the County and the Architect.

#### 1.08 CONTRACTOR'S USE OF PREMISES

- A. **Since the existing County building is partially occupied,** Contractor must obtain the County's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.
- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.

- E. No one, other than those directly involved in the demolition and construction, or specifically designated by the County or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor may install a construction security fence in a small corner of the existing parking lot and maintain that it will be locked when not in use. Keys to this fencing will be provided to the County.

#### 1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the County's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the County for disposition of same as indicated in the General Conditions.
- C. Section intentionally omitted.

#### 1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the County a **minimum of three (3) days written notice in advance of any need to shut off existing utility services** or to effect equipment interruptions. The County will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain County's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with County's use of the building(s) or adjacent facilities.

#### 1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.



- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

#### 1.12 WORK SEQUENCE

- A. Contractor shall be responsible for compliance with all requirements outlined in the hazardous materials sections of the Contract Documents.
- B. Construct Work in stages and at times to accommodate County operation requirements during the construction period; coordinate construction schedule and operations with the County.
- C. Phasing Schedule included in item 1.13 must be adhered to. Moving dates are included in the Phasing Schedule to show planned windows for relocation of building occupants. Liquidated damages may be assessed as described in the Contract Documents for failure to achieve milestone dates.
- D. This facility may be occupied during construction. County will provide contractor with schedule of uses; at the site during the construction period; Contractor is to coordinate work with the County and maintain safe access to all buildings at all times and to not disrupt ongoing uses. Contractor must comply with the following requirements:
- (1) If Contractor must shut down power to any part of the site, Contractor must provide temporary power for that section of the site.
- (2) Scope of work includes utility and systems upgrade and replacement that may impact the entire site. Work must be coordinated so that site-wide systems remain functional at all times until new systems work is complete and tested.

#### 1.13 PHASING SCHEDULE

No.	Milestones	Start	Complete
1	Anticipated Notice To Proceed		
2	Substantial Contract Completion		
3	Punchlist Work Completion		
4	Final Contract Completion		
5	County Move-in and Beneficial Occupancy		
6	Board Approval of Notice of Completion		

- A. The “Start” dates included in the phasing schedule indicate the date that work is to begin on the identified milestone scope of work.
- B. The “Complete” dates included in the phasing schedule indicates that the following must be complete:

- (1) The entire scope of work for the milestone work must be complete, including all utility work up to the building and all final termination and operation of all building systems.
  - (2) Fire alarm, telephone, data, public address and all other systems final connections must be complete and systems programmed and tested so that fully functional systems are provided.
  - (3) All punch list work must be complete.
  - (4) Maintenance and Operations Manuals must be submitted to the County.
  - (5) All required testing must be complete.
  - (6) All training for all building systems must be complete.
  - (7) Section intentionally omitted.
- C. Record Documents for the scope of work of each Milestone included in the Phasing Schedule must be submitted **within one week after completion of the Milestone**. AutoCAD files to be provided at Final Contract Completion.
- D. Notice to Proceed date is the anticipated date of issuance of the Notice to Proceed. If the Notice to Proceed is issued after the date indicated in the Phasing schedule, the start and completion dates of Milestone No. 1 and No. 6 will be adjusted by the number of days that the Notice to Proceed is delayed.

**PART 2 – PRODUCTS** Not Used.

**PART 3 – EXECUTION** Not Used.

END OF DOCUMENT

DOCUMENT 01 22 00

## UNIT PRICES AND ALTERNATES

### PART I – ALTERNATES

#### 1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Bid Form;
- D. Instruction to Bidders.

#### 1.02 DESCRIPTION

The items of work indicated below propose modifications to, substitutions for, additions to and/or deletions from the various parts of the Work specified in other Sections of the Specifications. The acceptance or rejection of any of the alternates is strictly at the option of the County subject to County's acceptance of Contractor's stated prices contained in this Proposal.

#### 1.03 GENERAL

Where an item is omitted, or scope of Work is decreased, all Work pertaining to the item whether specifically stated or not, shall be omitted and where an item is added or modified or where scope of Work is increased, all Work pertaining to that required to render same ready for use on the Project in accordance with the intention of the Drawings and Specifications shall be included in an agreed upon price amount.

#### 1.04 BASE BID

The Base Bid includes all work required to construct the Project completely and in accordance with the Contract Documents.

#### 1.05 ALTERNATES

- A. Add Alternate 1: Provide and install a 600amp electrical distribution panel as noted on sheet E-501.

The above Alternate descriptions are general in nature and for reference purposes only. The Contract Documents, including, without limitation, the Drawings and Specifications, must be referred to for the complete scope of Work.

## **PART 2 - UNIT PRICING**

### **2.01 GENERAL**

Contractor shall completely state all required figures based on Unit Prices listed below. Where scope of Work is decreased, all Work pertaining to the item, whether specifically stated or not, shall be omitted and where scope of Work is increased, all work pertaining to that item required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

### **2.02 UNIT PRICES**

Furnish unit prices for each of the named items on a square foot, lineal foot, or per each basis, as applies. Unit prices shall include all labor, materials, services, profit, overhead, insurance, bonds, taxes, and all other incidental costs of Contractor, subcontractors, and supplier(s).

**A. Section intentionally omitted.**

END OF DOCUMENT

DOCUMENT 01 26 00

**CONTRACT MODIFICATIONS**

Section intentionally omitted.

END OF DOCUMENT

DOCUMENT 01 29 00

**PAYMENT PROCEDURES**

Refer to section 00 72 13 General Conditions, subsection 19 Payments.

END OF DOCUMENT

DOCUMENT 01 31 19

## PROJECT MEETINGS

### PART I – GENERAL

#### 1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions
- B. Special Conditions

#### 1.02 PRECONSTRUCTION CONFERENCE:

The contractor shall attend a conference at the Project Site prior to the start of construction for the purpose of determining Contractor's access to, and use of the site, verifying utilities, review construction administrative procedures, and such other items as may be pertinent to the start of construction.

#### 1.03 PROGRESS MEETINGS:

- A. **County Project** Manager shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
  - (1) County Representative(s).
  - (2) Contractor.
  - (3) Contractor's Project Manager.
  - (4) Contractor's Superintendent.
  - (5) Subcontractors/suppliers, as appropriate to the agenda of the meeting.
  - (6) Inspector of record.
  - (7) Construction Manager, if any.

- (8) Project Manager
  - (9) Architect
  - (10) Engineer(s), if any and as appropriate to the agenda of the meeting.
  - (11) Others, as appropriate to the agenda of the meeting.
- D. The County's, the Architect's, and/or an engineer's Consultants will attend at their discretion, in response to the agenda.
- E. The County representative, the Construction Manager, and/or another County Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes, those exceptions shall be stated in writing to the County **within three (3) working days following County's distribution of the meeting notes.**

**1.04 PRE-INSTALLATION/PERFORMANCE MEETING:**

- A. Contractor shall schedule a meeting prior to the start of each of the following portions of the Work: cutting and patching of plaster and roofing, and other weather-exposed and moisture-resistant products. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the cutting and patching work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

**1.05 SPECIAL MEETINGS:**

Special meetings may be requested by the County. Contractor, subcontractors, material suppliers and any other members of the project team may be required to attend.

END OF DOCUMENT



DOCUMENT 01 33 00

## **SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

#### **1.02 SECTION INCLUDES:**

- A. Definitions:
  - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
  - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicate proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
  - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the County, the Architect, and all other concerned parties and shall

furnish, install, or perform the work, at a minimum, in accordance with those instructions.

- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
- (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the County, the Architect, and the Construction Manager.
  - (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
  - (3) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall **allow sufficient time so that no delay occurs due to required lead time in ordering or delivery** of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
  - (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
  - (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
  - (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
  - (7) **Contractor shall certify on submittals for review that submittals conform to Contract requirements.** In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Also certify that Contractor-furnished equipment can be installed in allocated space.
  - (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.

- (9) Upon demand by Architect or County, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with its proposed construction schedule and submit both to the County **within ten (10) days after the date of the Notice to Proceed.** Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the County.
- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revised and resubmit", etc.
- (3) All Submittals shall be forwarded to the County by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the County so as not to delay the Construction Schedule.

**1.03 SHOP DRAWINGS:**

- A. Contractor shall **submit five (5) full size prints.** The County will review and **return two (2) prints to Contractor.**
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.

- E. County shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. County's and/or Architect's review of Shop Drawings will be general. County and/or Architect review does not relieve Contractor of responsibility for accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. Shop Drawings reviewed by County and/or Architect is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, **Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm** that all Work contiguous with and having bearing on other work shown on **Shop Drawings is accurately drawn and in conformance with Contract Documents.**
- I. Submitted drawings and details must bear **stamp of approval of Contractor:**
  - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
  - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the County and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. **Contractor shall pay for cost of any changes in construction due to improper checking and coordination.** Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the County, the Architect, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:

- (1) Project name and address.
  - (2) Architect's name and project number.
  - (3) Shop Drawing title, number, date, and scale.
  - (4) Names of Contractor, Subcontractor(s) and fabricator.
  - (5) Working and erection dimensions.
  - (6) Arrangements and sectional views.
  - (7) Necessary details, including complete information for making connections with other Work.
  - (8) Kinds of materials and finishes.
  - (9) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.
- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
- (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
  - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The **Contractor shall check and approve the submittal(s) before submission for final review.**

#### 1.04 PRODUCT DATA OR SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must **submit a minimum of five (5) each, to the County. County shall return two (2) to the Contractor,** who shall reproduce whatever additional copies it requires for distribution.

- B. Contractor shall **submit five (5) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials** in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.

#### 1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall **submit five (5) samples** except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.
  - (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
  - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the County in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the County.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.

- F. Contractor shall not deliver any material to Site prior to receipt of County's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. County's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing **not less than sixty (60) days before such materials are required to be used in Work.**
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at County's direction:
  - (1) Size: As Specified.
  - (2) Furnish catalog numbers and similar data, as requested.

**1.06 REVIEW AND RESUBMISSION REQUIREMENTS:**

- A. The County will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below **within twenty one (21) days after receipt** or within twenty one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. **Two (2) copy of product or materials data will be returned to Contractor** with the review status.
- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will

be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), **within fourteen (14) days after receipt** thereof or within fourteen (14) days after receipt of all related information necessary for such review.

- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the County's and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the County **no later than fourteen (14) days or a reasonable shorter period** as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. County's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

END OF DOCUMENT



DOCUMENT 01 35 13.23

## LEED™ REQUIREMENTS

### PART I -- GENERAL

#### 1.01 SUMMARY

- A. Section Includes: General requirements and procedures for compliance with certain U.S. Green Building Council's (USGBC) LEED™ prerequisites and credits needed for the Project to obtain minimum **LEED™ Silver self-certification (through County, not USGBC)**.
  - 1. Other LEED™ prerequisites and credits needed to obtain LEED™ certification are dependent on material selections and may not be specifically identified as LEED™ requirements. Compliance with requirements needed to obtain LEED™ prerequisites and credits may be used as one criterion to evaluate substitution requests.
  - 2. Additional LEED™ prerequisites and credits needed to obtain the indicated LEED™ certification are dependent on the Architect's design and other aspects of the Project that are not part of the Work of the Contract.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- C. Related Documents
  - 1. Document 01 10 00 - Summary of Work: For summary of work.
  - 2. Document 01 50 00 - Temporary Facilities and Controls: For requirements for temporary facilities and controls, including temporary utilities, support facilities and security and protection.
  - 3. Document 01 62 00 - Product Options and Substitutions: For procedures for selecting products and requesting substitutions.
  - 4. Divisions 02 through 49 Sections for LEED™ requirements specific to the Work of each of those Sections. These requirements may or may not include reference to LEED™.

#### 1.02 REFERENCES

- A. ANSI - American National Standards Institute
- B. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
  - 1. 52.2 - Method of Testing General Ventilation Air Cleaning Devices for removal Efficiency by Particle Size.
  - 2. 55 - Thermal Comfort Conditions for Human Occupancy.
  - 3. 62.1 - Ventilation for Acceptable IAQ.
  - 4. 90.1 - Energy Standard for Buildings Except Low-Rise Residential.

- C. ASTM - American Society for Testing and Materials
  - 1. E408 -Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
  - 2. E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
  - 3. E1903 - Standard Guide for Environmental Site Assessments: Phase 11 Environmental Site Assessment Process.
  - 4. E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
- D. Center for Resource Solutions
  - 1. Green-e Product Certification Requirements.
- E. CR1 - Carpet and Rug Institute
  - 1. Green Label Plus Testing Program.
- F. Energy Star
- G. EPA - Environmental Protection Agency
  - 1. Brownfields Definition.
  - 2. Compendium of Methods for the Determination of Air Pollutants in Indoor Air.
  - 3. Energy Policy Act (EPAct) of 1992.
  - 4. Guidance Specifying Management Measures for Sources of Non-point Pollution in Coastal Waters (EPA 840B92002, January 1993).
  - 5. Stormwater Management for Construction Activities (USEPA Document No. EPA 832R92005, Chapter 3).
- H. FSC - Forest Stewardship Council
- I. Green Seal
  - 1. GC-03 - Anti-Corrosive Paints.
  - 2. GS-11 - Paints.
- J. IPMVP - International Performance Measurement and Verification Protocol
  - 1. Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.
- K. ISO - International Standards Organization
  - 1. 14021 - Environmental Labels.
- L. SCAQMD - South Coast Air Quality Management District
  - 1. Rule 1113 - Architectural Coatings.
  - 2. Rule 1168 - Adhesive Applications, October, 2003 Amendment.
- M. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association

1. IAQ Guideline for Occupied Buildings Under Construction.
- N. USDA - United States Department of Agriculture
  1. Definition of Prime Agricultural Land: US Code of Federal Regulations Title 7, Volume 6, Parts 400 to 699, Section 657.5 (7CFR657.5).
- O. USGBC - U. S. Green Building Council
  1. LEED™-NC v2.2, Green Building Rating System.

### 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 1.2, “Principles and Criteria”. Certificates shall include evidence that mill is certified for chain-of-custody by an FSC-accredited certification body.
- B. LEED™: Leadership in Energy & Environmental Design.
- C. Rapidly Renewable Materials: Materials made from agricultural products that are typically harvested within a ten-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.
- D. Regionally Manufactured Materials: Materials that are manufactured **within a radius of 500 miles from the Project location**. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.
- E. Regionally Extracted, Harvested, or Recovered Materials: Materials that are extracted, harvested, or recovered and manufactured **within a radius of 500 miles from the Project site**.
- F. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).
  1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.
  2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

### 1.04 SUBMITTALS

- A. General: Submit additional LEED™ submittal requirements included in other sections of the Specifications.

- B. LEED™ submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED™ requirements.
- C. LEED™ submittals must be prepared and submitted using the LEED™-Online credit website.
  - 1. The Contractor is responsible for obtaining project access to LEED™-Online and joining the project using the project's IS digit project access code.
    - a. Access to the credit templates requires installation of Adobe Reader or Professional 7.0 or higher.
  - 2. The LEED™ Project Administrator or Architect will assign the LEED™ credits that the Contractor is responsible for completing.
    - a. Each credit template is an editable Adobe pdf document.
    - b. Each credit template may be completed or updated at any time prior to the LEED™ Construction Submittal to the County.
    - c. After completion of each credit documentation, notify the County Project Manager.
    - d. Additional submittal documentation and back-up requirements should be given to the County Project Manager.
- D. Project Materials Cost Data: Include specific material cost data for individual components and materials (not including labor) where required as part of LEED™ pre-requisite and credit submittals. To avoid repeated calculations, cost data shall be consistent for all credits requiring similar material cost data.
- E. LEED™ Project Goals:
  - 1. SS Prerequisite (Erosion and Sedimentation Control).
  - 2. SS 4.2 (Bike racks component).
  - 3. SS 4.3 (Low-emitting/fuel efficient vehicles signage component).
  - 4. SS 4.4 (Carpool signage component).
  - 5. SS 6.1 and 6.2 (Stormwater Management and Treatment).
  - 6. SS 7.2 (Heat Island: Roof).
  - 7. SS 8 (Light Pollution Reduction).
  - 8. WE I (Water Efficient Landscaping).
  - 9. WE 2 (Innovative Wastewater Technologies).
  - 10. WE 3 (Water Use Reduction).
  - 11. LA Prerequisite I (Fundamental Commissioning).
  - 12. EA 1 (Optimized Energy Performance).
  - 13. EA 3 (Additional Commissioning).
  - 14. EA 4 (Ozone Depletion: No HCFCs).
  - 15. MR 2.1 and 2.2 (Construction Waste Management).
  - 16. MR 4.1 and 4.2 (Recycled Content).
  - 17. MR 6 (Rapidly Renewable Materials).
  - 18. MR 7 (FSC Certified Wood).
  - 19. EQ 3.1 and 3.2 (Construction IAQ Management Plan: During and After Construction).

20. EQ 4.1, 4.2, 4.3, and 4.4 (Low-Emitting Materials).
21. EQ 5 (Permanent entryway grate component).
22. EQ 6.1 and 6.2 (Controllability of Systems: Perimeter and Non-Perimeter).
23. ID Credits (Construction/materials implications).

F. LEED™ Action Plans: Provide preliminary submittals **to the County Project Manager within 7 days of date established for commencement of the Work** indicating how the following requirements will be met:

1. Credit MR 2.1 and Credit MR 2.2: Waste management plan.
2. Credit MR 4.1 and Credit MR 4.2: List of proposed materials with recycled content.
  - a. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
3. Credit MR 5.1 and Credit MR 5.2: List of proposed regionally manufactured materials and regionally extracted, harvested, or recovered materials.
  - a. Identify each regionally manufactured material, its source, and cost.
  - b. Identify each regionally extracted, harvested or recovered material, its source, and cost.
4. Credit MR 7.0: List of proposed certified wood products.
  - a. Indicate each product containing certified wood, its source, and cost.
  - b. Include statement indicating total cost for wood-based materials used for Project, including non-rented temporary construction.

G. LEED™ Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED™ action plans for the following:

1. Credit MR 2.1 and Credit MR 2.2: Waste reduction progress reports.
2. Credit MR 4.1 and Credit MR 4.2: Recycled content.
3. Credit MR 5.1 and Credit MR 5.2: Regionally manufactured materials and regionally extracted, harvested, or recovered materials.
4. Credit EQ 3.1: Construction IAQ Management Plan.

H. LEED™ Documentation Submittals

1. Credit SS 7.2: Product Data for roofing materials indicating Energy Star compliance.
2. Credit SS 8.0: Product Data for interior and exterior lighting fixtures that stop direct-beam illumination from leaving the building site.
3. Credit MR 2.1 and Credit MR 2.2
  - a. Complete the construction waste calculation tables in the LEED™ credit template. The following information will be required to fill in these tables:
    - 1) General description of each type/category of waste generated.
    - 2) Location of receiving agent (recycler/landfill) for waste.
    - 3) Quantity of waste diverted (by category) in tons or cubic yards.
  - b. Provide a narrative describing the project's construction waste management approach. The narrative should include the project's Construction Waste

Management Plan. Please provide any additional comments or notes to describe special circumstances or considerations regarding the project's credit approach.

4. CreditMR4.1 and Credit MR 4.2
  - a. Complete the LEED™ credit template to provide the following information:
    - 1) Provide the total project materials cost or provide the total project cost to **apply the 45 percent default materials value.**
    - 2) Provide a tabulation of each material used on the project that is being tracked for recycled content. The tabulation must include a description of the material, the manufacturer of the material, the product cost, the pre-consumer and/or post consumer recycled content percentage, and the source of the recycled content data.
  - b. Provide an optional narrative describing any special circumstances or considerations regarding the project's credit approach.
5. Credit MR 5.1 and Credit MR 5.2: Product Data indicating location of material manufacturer for regionally manufactured materials.
  - a. Include statement indicating cost and distance from manufacturer to Project for each regionally manufactured material.
  - b. Include statement indicating cost and distance from point of extraction, harvest, or recovery to Project for each raw material used in regionally manufactured materials.
6. Credit MR 6.0: Product Data for rapidly renewable materials.
  - a. Include statement indicating costs for each rapidly renewable material.
7. Credit MR 7.0
  - a. Complete the LEED™ credit template to provide the following information:
    - 1) A list of items (and/or components of products) claimed as FSC certified, including product type, manufacturer, and the appropriate entity's Chain of Custody (COC) certification number. Each product name can then be cross-referenced with the manufacturer or vendor COC number during the LEED™ certification review. Visit [www.fscus.org/green](http://www.fscus.org/green) building for more information.
  - b. Provide an optional narrative describing any special circumstance or considerations regarding the project's credit approach.
8. Credit EQ 3.1
  - a. Complete the LEED™ credit template to provide the following information:
    - 1) Provide a copy of the project's Indoor Air Quality (IAQ) Management Plan.
    - 2) Confirm if the permanently installed air handling equipment was used during construction.
    - 3) Provide photos to highlight the implemented construction IAQ practices.
    - 4) List all filtration media (manufacturer, model number, MERV rating, location of installed filter) installed during construction and confirm that each unit replaced prior to occupancy.
  - b. Provide an optional narrative describing any special circumstance or non-

- standard approach taken by the project.
9. Credit EQ 3.2
    - a. Complete the LEED™ credit template to provide the following information:
      - 1) Confirm the approach taken by project (pre-occupancy flush-out; flush-out with early occupancy; IAQ testing).
      - 2) Provide a copy of the project's Indoor Air Quality Testing Report (if applicable).
    - b. Provide a narrative describing the project's specific flush-out procedures and/or IAQ testing process and results.
  10. Credit EQ 4.1
    - a. Complete the LEED™ credit template to provide the following information:
      - 1) Provide a listing of each indoor adhesive, sealant and sealant primer product used on the project. Include the manufacture's name, product name, specific VOC data (in g/L less water) for each product, and the corresponding allowable VOC from the referenced standard (listed on page 333 of the LEED™-NC v2.2 Reference Guide).
      - 2) Provide a listing of each indoor aerosol adhesive product used on the project. Include the manufacture's name, product name, specific VOC data (in g/L less water) for each product, and the corresponding allowable VOC from the referenced standard (listed on page 333 of the LEED™-NC v2.2 Reference Guide).
    - b. Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.
  11. Credit EQ 4.2
    - a. Complete the LEED™ credit template to provide the following information:
      - 1) Provide a listing of each indoor paint and coating used on the project. Include the manufacture's name, product name, specific VOC data (in g/L less water) for each product, and the corresponding allowable VOC from the referenced standard (listed on page 337 of the LEED™-NC v2.2 Reference Guide).
    - b. Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.
  12. Credit EQ 4.3
    - a. Complete the LEED™ credit template to provide the following information:
      - 1) Provide a listing of carpet product installed in the building interior. Confirm that the product complies with CR1 Green Label Plus Testing Program. For more information visit [www.carpet-rug.org](http://www.carpet-rug.org).
      - 2) Provide a listing of carpet cushion product installed in the building interior. Confirm that the product complies with CR1 Green Label Testing Program. For more information visit [www.carpet-rug.org](http://www.carpet-rug.org).
    - b. Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.



13. Credit EQ 4.4

- a. Complete the LEED™ credit template to provide the following information:
  - 1) Provide a listing of each composite wood and agrifiber product installed in the building interior. Confirm that the product does not contain any added urea-formaldehyde.
- b. Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.

**1.05 SUBSTITUTIONS**

- A. In addition to the requirements of Document 01 62 00, the special substitution requirements described here apply only to the LEED™ certification related materials and requirements and environmental products and procedures identified in this Section.
- B. Notify Owner and Architect when Contractor wishes to substitute materials, equipment, or products that meet the aesthetic and programmatic intent of the Construction Documents and offer equivalent or increased environmental sensitivity to materials, equipment, or products specified to meet LEED™ requirements as indicated in the Construction Documents.
- C. Substitutions that may affect LEED™ certification must be clearly stated as such.
- D. Comply with the requirements of Document 01 62 00, except as follows:
  1. **Only one request for substitution for each product will be considered.** When substitution is not accepted, provide specified product. Prior to submitting detailed information required under Document 01 62 00, submit the following for initial review by the Architect:
    - a. Product data including manufacturers' names, addresses, and phone numbers.
    - b. Include copy of Material Safety Data Sheet (MSDS) if applicable.
    - c. Description of the differences of the proposed substitution from specified product related to LEED™ requirements. Include description of environmental advantages and disadvantages of proposed substitution over specified product.
- E. The Contractor is responsible for re-submittal of all calculations and documentation of products or material substitutions that affect LEED™ prerequisites and credits referenced in this Section, and which apply to any credits previously submitted, and all credits included in the LEED™ Construction Submittal. Products that do not meet these requirements should not be submitted for substitution. Substitutions of materials and products specified as part of the Contract Documents in the following areas (but not necessarily limited to these items) will require review and potential re-submittal:
  1. Irrigation system.
  2. Stormwater system.
  3. Roofing products and materials.
  4. Plumbing fixtures and controls.



5. Interior and exterior lighting systems and controls.
  6. HVAC equipment, systems, and controls.
  7. CO2 monitoring system.
- F. Substituted products shall not be ordered or installed without written acceptance by the owner.
- G. Requests for Substitutions
1. Submit a separate request for each LEED™ related product substitution.
  2. Identify product by Specification Section and LEED™ credit or credits, if applicable.
  3. List similar projects using product, dates of installation, and names of Contractor and Owner.
  4. Give itemized comparison of proposed substitution with specified product, listing variations, and reference Specification Section and Article number.
  5. Include copy of Material Safety Data Sheet (MSDS) if applicable.
  6. Give cost data comparing proposed substitution with specified product and amount of net change to Contract Sum. The cost data should be based on life cycle analysis for each affected product including annual energy consumption and maintenance costs.
  7. State the effect of substitution on construction schedule and changes required in other work of products.

## PART 2- PRODUCTS

### 2.01 RECYCLED CONTENT OF MATERIALS

- A. Credit MR 4.1 and Credit MR 4.2: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a **minimum of 10 percent of the cost of materials used** for the Project.
1. The cost of post-consumer recycled content of an item shall be determined by dividing the weight of post-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.
  2. The cost of post consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing the weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.
  3. Do not include mechanical and electrical components in the calculation.
  4. Recycled content of materials shall be defined according to the Federal Trade Commission's "Guide for the Use of Environmental Marketing Claims", 16 CFR 260.7 (e).

### 2.02 REGIONAL MATERIALS

- A. Credit MR 5.1: Provide **20 percent of building materials (by cost) that are regionally manufactured materials.**

- B. Credit MR 5.2: Of the regionally manufactured materials required by Paragraph “Credit MR 5.1” above, provide **at least 50 percent (by cost) that are regionally extracted, harvested, or recovered materials.**

## 2.03 CERTIFIED WOOD

- A. Credit MR 7.0: Provide a **minimum of 50 percent (by cost) of wood-based materials** that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, “Principles and Criteria”.
1. Wood-based materials include but are not limited to the following materials when made from wood, engineered wood products, or wood-based panel products:
    - a. Rough carpentry.
    - b. Miscellaneous carpentry.
    - c. Heavy timber construction.
    - d. Wood decking.
    - e. Metal-plate-connected wood trusses.
    - f. Structural glued-laminated timber.
    - g. Finish carpentry.
    - h. Architectural woodwork.
    - i. Wood cabinets.
    - j. Non-rented temporary construction, including bracing, concrete formwork, pedestrian barriers, and temporary protection.

## 2.04 LOW-EMITTING MATERIALS

- A. Credit EQ 4.1: For interior applications use adhesives and sealants that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
1. Wood Glues: 30 g/L.
  2. Metal to Metal Adhesives: 30 g/L.
  3. Adhesives for Porous Materials (Except Wood): 50 g/L.
  4. Subfloor Adhesives: 50 g/L.
  5. Plastic Foam Adhesives: 50 g/L.
  6. Carpet Adhesives: 50 g/L.
  7. Carpet Pad Adhesives: 50 g/L.
  8. VCT and Asphalt Tile Adhesives: 50 g/L.
  9. Cove Base Adhesives: 50 g/L.
  10. Gypsum Board and Panel Adhesives: 50 g/L.
  11. Rubber Floor Adhesives: 60 g/L.
  12. Ceramic Tile Adhesives: 65 g/L.
  13. Multipurpose Construction Adhesives: 70 g/L.
  14. Fiberglass Adhesives: 80 g/L.
  15. Structural Glazing Adhesives: 100 g/L.
  16. Wood Flooring Adhesive: 100 g/L.

17. Contact Adhesive: 250 g/L.
18. Plastic Cement Welding Compounds: 350 g/L.
19. ABS Welding Compounds: 400 g/L.
20. CPVC Welding Compounds: 490 g/L.
21. PVC Welding Compounds: 510 g/L.
22. Adhesive Primer for Plastic: 650 g/L.
23. Sealants: 250 g/L.
24. Sealant Primers for Nonporous Substrates: 250 g/L.
25. Sealant Primers for Porous Substrates: 775 g/L.

B. Credit EQ 4.2: For interior applications use paints and coatings that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24) and the following chemical restrictions:

1. Flat Paints and Coatings: VOC not more than 50 g/L.
2. Non-Flat Paints and Coatings: VOC not more than 150 g/L.
3. Anti-Corrosive Coatings: VOC not more than 250 g/L.
4. Varnishes and Sanding Sealers: VOC not more than 350 g/L.
5. Stains: VOC not more than 250 g/L.
6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
7. Restricted Components: Paints and coatings shall not contain any of the following:
  - a. Acrolein.
  - b. Acrylonitrile.
  - c. Antimony.
  - d. Benzene.
  - e. Butyl benzyl phthalate.
  - f. Cadmium.
  - g. Di (2-ethylhexyl) phthalate.
  - h. Di-n-butyl phthalate.
  - i. Di-n-octyl phthalate.
  - j. 1,2-dichlorobenzene.
  - k. Diethyl phthalate.
  - l. Dimethyl phthalate.
  - m. Ethylbenzene.
  - n. Formaldehyde.
  - o. Hexavalent chromium.
  - p. Isophorone.
  - q. Lead.
  - r. Mercury.
  - s. Methyl ethyl ketone.
  - t. Methyl isobutyl ketone.
  - u. Methylene chloride.
  - v. Naphthalene.
  - w. Toluene (methylbenzene).

- x. 1,1,1 -trichloroethane.
  - y. Vinyl chloride.
- C. Credit EQ 4.4: Do not use composite wood and agrifiber products that contain urea-formaldehyde resin.

END OF DOCUMENT

DOCUMENT 01 35 13.26

**CONSTRUCTION WASTE MANAGEMENT**

**PART 1 – GENERAL**

1.01 SUMMARY

- A. This section specifies the requirements for the diversion of demolition (non-hazardous) and construction debris from landfill and submittal of the Waste Management Plan.
- B. Related requirements specified elsewhere include:
  - 1. Requirements for temporary facilities and controls are indicated in Section 01500 – Temporary Facilities and Controls.
- C. Performance Requirement: Divert a minimum of 65% construction and demolition (non-hazardous) debris from landfill. This project has a debris diversion goal of 75%.

1.03 DEFINITIONS

- A. "Conversion Rate" means the rate set forth in the standardized Conversion Rate Table (see Page 8) approved by the County of Alameda for use in estimating the weight of materials identified in the Waste Management Plan and Waste Management Table (see Page 7).
- B. "Divert" means to use material for any purpose other than disposal in a landfill or transfer facility.
- C. "Good faith" shall be as defined by law.
- D. "Recycling Service" means an off-site service that provides processing of material and diversion from landfill.
- E. "Hauler" means the entity that transports construction and demolition debris to either a landfill or a recycling service.

1.04 QUALITY ASSURANCE

- A. The Contractor shall obtain all special permits and licenses and meet all special requirements for performance and completion of the work of this section.
- B. Regulatory requirements
  - 1. Approval of the Waste Management Plan and Waste Management Table by the County of Alameda is required before beginning construction or demolition.
- C. Recycling service company qualifications – any of the following:
  - 1. Listed in the “*Recycle Where Directory*” an online database maintained by Stop-Waste.Org with approved recycling vendors and facilities. The “*Recycling Where Direc-*

tory” can be accessed at [www.StopWaste.Org](http://www.StopWaste.Org) or by calling 1-877-STOPWASTE (1-877-786-7927).

2. If not listed, submit certification in writing from any recycling services that accepted the debris which will be diverted from landfill.

#### 1.05 SUBMITTALS

- A. Submit specified Waste Management Plan to indicate how waste will be diverted from landfills. Plan to include procedures and schedule for debris disposal. Submittal is required **within 7 calendar days after receipt of Notice to Proceed** and prior to any waste removal.
- B. Submit certification from recycling services that are not listed in the “*Recycling Where Direction*”. Written documentation must be provided identifying where the construction and demolition material is taken, what method or process is being used to recycle the material, and identifying applicable state and local permits held by the recycling service provider and recycling facility.
- C. Submit completed Waste Management Plan, of this Section, **at 50 percent progress payment application and at 100 percent status report upon completion of the Work. The 100 percent status report is required before full release of retention.**

#### 1.06 WASTE MANAGEMENT PLAN

- A. Plan Development: Develop a plan for diverting the specified percentage of construction debris from landfill. The plan shall include the following:
  1. Submit **within 7-calendar days after receipt of Notice to Proceed** and prior to any waste removal.
  2. Propose means and methods for collecting and separating each type of debris deemed reusable or recyclable.
  3. Identify the off-site recycling service and hauler of each designated debris item, who has agreed to accept and divert that item from landfill, in the proposed quantities anticipated. Schedule each item and list off-site recycling service and hauler company name, telephone number, address, and person contacted.
  4. Include a "good faith" estimate of each type of construction waste, as applicable, that would be generated if no diversion methods were implemented. Submit with calculations based upon weight of each. The following items are subject to the "good faith" estimate and diversion requirement:
    - a. Asphalt & Concrete
    - b. Brick/Masonry/Tiles
    - c. Building Materials (doors, windows, fixtures, etc.)
    - d. Cardboard and other paper products

- e. Carpet/Carpet Padding/Foam
  - f. Ceiling Tiles (acoustic)
  - g. Drywall
  - h. Electrical Components (light fixtures, cables, etc)
  - i. Film Plastic & Styrofoam Blocks
  - j. Landscape Debris (Plant & tree trimmings)
  - k. Mechanical Debris (ducts, controls, plumbing fixtures, etc)
  - l. Scrap Metal
  - m. Unpainted Wood and Pallets
  - n. Other (painted wood & drywall, roofing, etc)
  - o. Mixed C&D (defined as a mixture of three or more materials from construction or demolition sites that will be taken to a "qualified" facility for recycling.)
  - p. Trash/garbage
5. Calculate quantities, and convert volume measurements to weights in accordance with the defined Conversion Rate.

**B. Plan Implementation**

- 1. Maintain a log of each load, of each category item diverted from landfill. Log in separately the debris sent to a Class III landfill and the materials sent to recycling facilities.
  - a. Include in the log, type of load, load weight, name of hauling service; recycling service or landfill, and date accepted by recycling service or by landfill.
  - b. The County reserves the right to audit the log at any time. Contractor shall retain and provide to the County all weight tickets, copies of receipts and invoices and any other documentation related to the disposal or recycling of generated waste/debris from demolition and construction activities.
  - c. Units of measure: Use same units as stated in the accepted Construction Waste Management plan "good faith" estimate of construction waste that would be generated if no remedial methods were implemented.
- 2. Material handling
  - a. Separation facilities

- 1) Designate a specific on site area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return.
- 2) Keep waste bins and pile areas neat and clean. Clearly mark bins for each category of waste. Do not co-mingle non-recyclable waste with materials designated for reuse or recycling.
- b. Environmental controls during handling, storage, or transport: Do not permit designated materials to become contaminated or to contaminate site or surrounding areas.
3. Training and coordination
  - a. Furnish copies of the Waste Management Plan to all on-site supervisors, each subcontractor, the County, and the Architect before/prior to commencement of the Work.
  - b. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all entities at the appropriate stages of the Project.
  - c. Meetings: Include Construction Waste Management on the agenda of meetings. At a minimum, discuss waste management goals and issues at the following meetings:
    - 1) Pre-bid meeting(s).
    - 2) Pre-construction meeting(s).
    - 3) Regularly scheduled job-site meetings.

## **PART 2 - PRODUCTS**

### **MATERIALS, EQUIPMENT AND FACILITIES**

- A. Furnish all materials, tools, equipment, devices, appurtenances, facilities, and services required for performing waste management of debris covered under this Section's Scope of Work.
- B. Facilities authorized to accept mixed C&D waste for recycling and facilities that accept other types of waste are listed in the "Recycle Where Directory" an online database maintained by StopWaste.Org with approved recycling vendors and facilities. The "Recycling Where Directory" can be accessed at [www.StopWaste.Org](http://www.StopWaste.Org) or by calling 1-877-STOPWASTE (1-877-786-7927).

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION AND PREPARATION**

- A. Perform as required in the Waste Management Plan accepted by the County.

### **3.02 DISPOSAL OF DEBRIS**



- A. Dispose of waste, trash and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Burying of trash and debris on the site will not be permitted.
- B. Remove demolished materials from site as work progresses. Remove debris from the site so that its presence will not delay the progress of the work.
- C. Debris shall be the property of the Contractor and shall be removed and disposed of in a legal manner off the County's property in accordance with the accepted Waste Management Plan described herein. Location of recycling facility or dump and length of haul shall be the Contractor's responsibility.

END OF DOCUMENT

Waste Management Plan

Many of the materials generated from your project can be recycled. You are required to list materials that will be reused, recycled or disposed from your project.

See PART 1 – GENERAL, 1.01 SUMMARY, C. Performance Requirements.

Use **tons** to quantify total estimated waste and percentages for materials. Ask your hauler, recycler or site cleanup vendor to assist you with this plan. Receipts of all recycling and disposal must be submitted after project completion.

Project Name: **Environmental Health Office Remodel**

Location:

Type of Project: ☐ New Construction ☐ Remodel/Renovation ☐ Demolition and Replacement

Square Footage: \_\_\_\_\_

Type of Construction (wood frame, concrete, steel, etc.): \_\_\_\_\_

Total Project Value: \$\_\_\_\_\_

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

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

Recycler #1: \_\_\_\_\_ Contact: \_\_\_\_\_

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

Recycler #2: \_\_\_\_\_ Contact: \_\_\_\_\_

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

Recycler #3: \_\_\_\_\_ Contact: \_\_\_\_\_

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

Questions? Call Alameda County Project Manager, GSA - Capital Program.

Submit this form and the attached Waste Management table to:

Project Manager:

County of Alameda GSA- Capital Program

1401 Lakeside Drive, Suite 800

Oakland, CA 94512

**Waste Management Plan**

Project Name: **Environmental Health Office Remodel**

Total Estimated Waste Generated by Project: _____ tons (Ask your hauler, recycler or site cleanup vendor to assist you. Use receipts from your previous jobs for estimates)					
<b>Complete and return within 7-calendar days after receipt of Notice to Proceed,</b>			<b>Complete and return with receipts at 50% progress payment and at 100% status report.</b>		
Material Type	Estimated Reused/ Recycled	Estimated Disposed/ Landfilled	Actual Re-used/ Recy- cled	Actual Dis- posed/ Landfilled	Vendor or Facility Used (Destination)
Asphalt & Concrete					
Bricks/Masonry/Tiles					
Building Materials (doors, win- dows, fixtures, etc.)					
Cardboard & other paper prod- ucts					
Carpet/Carpet Padding/Foam					
Ceiling Tiles (acoustic)					
Drywall (new, unpainted)					
Electrical Components (light fixtures, cables, etc)					
Film Plastic & Styrofoam Blocks					
Landscape Debris (Plant & Tree Trimmings)					
Mechanical Debris (ducts, con- trols, plumbing fixtures, etc)					
Scrap Metal					
Unpainted Wood & Pallets					
Other (painted wood & drywall, roofing, etc.)					
Mixed C&D*					
Trash/Garbage					
<b>TOTAL</b>					

- \* Mixed C&D is defined as a mixture of three or more materials (e.g. wood, drywall, roofing, insulation, etc.) from construction or demolition sites that will be taken to a facility for recycling approved by the Alameda County Waste Management Authority.
- \* Recycling rates for mixed C&D debris loads vary among Recycling vendors and facilities. For the purposes of calculating your Waste Management Table, assume that 70% by weight of the “mixed C&D debris” are re-used/recycled and 30% are disposed/land-filled.

Did you have difficulties finding recycling vendors?    ☐ Yes    ☐ No

If the estimated amount reused/recycled is less than the 75% goal, please explain why:

---

If the actual amount reused/recycled is less than the 75% goal, please explain why:

---

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

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

### **Conversion Rates**

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/cy</b>	<b>Tons/cy</b>
Asphalt	1,400 lbs/cy	0.7 tons/cy
Cardboard	100 lbs/cy	0.05 tons/cy
Concrete	2,600 lbs/cy (Sources range from 1,000 to 4,000)	1.3 tons/cy
Drywall	700 lbs/cy	0.35 tons/cy
Wood (chipped)	300 - 650 lbs/cy	0.15 – 0.3 tons/cy
Mixed C&D Debris	900 lbs/cy	0.45 tons/cy
Mixed Waste/Trash	100 - 350 lbs/cy	0.5 - 0.175 tons/cy

**END OF WASTE MANAGEMENT PLAN**

DOCUMENT 01 41 00

## **REGULATORY REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits and Licenses and Work To Comply With All Applicable Regulations;
- B. Special Conditions;
- C. Quality Control.

#### **1.02 DESCRIPTION:**

- A. This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

#### **1.03 REQUIREMENTS OF REGULATORY AGENCIES:**

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction of the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the County and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
- B. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings.
  - (1) Building Standards Administrative Code, Part 1, Title 24, CCR
  - (2) California Building Code (CBC), Part 2, Title 24, CCR; (Volumes 1-3 and California Amendments).

- (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
- (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
- (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).
- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (Fire Plumbing Code and California Amendments).
- (7) California Referenced Standards Code, Part 12, Title 24, CCR
- (8) Title 19, CCR, Public Safety, State Fire Marshal Regulations.
- (9) Partial List of Applicable NFPA Standards:
  - (a) NFPA 13 - Automatic Sprinkler System.
  - (b) NFPA 14 - Standpipes Systems.
  - (c) NFPA 17A - Wet Chemical System
  - (d) NFPA 24 - Private Fire Mains.
  - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
  - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
  - (g) FPA 2001 - Clean Agent Fire Extinguishing Systems.

END OF DOCUMENT

DOCUMENT 01 42 13

## ABBREVIATIONS AND ACRONYMS

### PART 1 – GENERAL

#### 1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions
- B. Special Conditions

#### 1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	Aluminum Association
2.	AAMA	Architectural Aluminum Manufacturers Association
3.	AASHTO	American Association of State Highway and Transportation Officials
4.	ABPA	Acoustical and Board Products Association
5.	ACI	American Concrete Institute
6.	AGA	American Gas Association
7.	AGC	Associated General Contractors
8.	AHC	Architectural Hardware Consultant
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AIEE	American Institute of Electrical Engineers
12.	AISC	American Institute of Steel Construction
13.	AISI	American Iron and Steel Institute
14.	AMCA	Air Moving and Conditioning Association
15.	ANSI	American National Standards Institute
16.	APA	American Plywood Association
17.	ARI	Air Conditioning and Refrigeration Institute
18.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
19.	ASME	American Society of Mechanical Engineers
20.	ASSE	American Society of Structural Engineers

21.	ASTM	American Society of Testing and Materials
22.	AWPB	American Wood Preservers Bureau
23.	AWPI	American Wood Preservers Institute
24.	AWS	American Welding Society
25.	AWSC	American Welding Society Code
26.	AWI	Architectural Woodwork Institute
27.	AWWA	American Water Works Association
28.	BIA	Brick Institute of America
29.	CCR	California Code of Regulations
30.	CLFMI	Chain Link Fence Manufacturers Institute
31.	CMG	California Masonry Guild
32.	CRA	California Redwood Association
33.	CRSI	Concrete Reinforcing Steel Institute
34.	CS	Commercial Standards
35.	CSI	Construction Specifications Institute
36.	CTI	Cooling Tower Institute
37.	FGMA	Flat Glass Manufacturer's Association
38.	FIA	Factory Insurance Association
39.	FM	Factory Mutual
40.	FS	Federal Specification
41.	FTI	Facing Title Institute
42.	GA	Gypsum Association
43.	ICBO	International Conference of Building Officials
44.	IEEE	Institute of Electrical and Electronic Engineers
45.	IES	Illumination Engineering Society
46.	LIA	Lead Industries Association
47.	MIA	Marble Institute of America
48.	MLMA	Metal Lath Manufacturers Association
49.	MS	Military Specifications
50.	NAAMM	National Association of Architectural Metal Manufacturers
51.	NBHA	National Builders Hardware Association
52.	NBFU	National Board of Fire Underwriters
53.	NBS	National Bureau of Standards
54.	NCMA	National Concrete Masonry Association
55.	NEC	National Electrical Code
56.	NEMA	National Electrical Manufacturers Association
57.	NFPA	National Fire Protection Association/National Forest Products Association
58.	NMWIA	National Mineral Wool Insulation Association
59.	NTMA	National Terrazzo and Mosaic Association
60.	NWMA	National Woodwork Manufacturer's Association
61.	ORS	Office of Regulatory Services (California)
62.	OSHA	Occupational Safety and Health Act
63.	PCI	Precast Concrete Institute



64.	PCA	Portland Cement Association
65.	PDCA	Painting and Decorating Contractors of America
66.	PDI	Plumbing Drainage Institute
67.	PEI	Porcelain Enamel Institute
68.	PG&E	Pacific Gas & Electric Company
69.	PS	Product Standards
70.	SDI	Steel Door Institute; Steel Deck Institute
71.	SJI	Steel Joist Institute
72.	SSPC	Steel Structures Painting Council
73.	TCA	Tile Council of America
74.	TPI	Truss Plate Institute
75.	UBC	Uniform Building Code
76.	UL	Underwriters Laboratories Code
77.	UMC	Uniform Mechanical Code
78.	USDA	United States Department of Agriculture
79.	VI	Vermiculite Institute
80.	WCLA	West Coast Lumberman's Association
81.	WCLB	West Coast Lumber Bureau
82.	WEUSER	Western Electric Utilities Service Engineering Requirements
83.	WIC	Woodwork Institute of California
84.	WPOA	Western Plumbing Officials Association

END OF DOCUMENT

## **DEFINITIONS AND REFERENCE STANDARDS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISION**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions;

#### **1.02 QUALITY ASSURANCE:**

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the County and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

### 1.03 SCHEDULE OF REFERENCES:

The following information is intended only for the general assistance of the Contractor, and the County does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	Aluminum Association 900 19 <sup>th</sup> Street NW, Suite 300 Washington, DC 20006 <a href="http://www.aluminum.org">www.aluminum.org</a>	202/862-5100
AABC	Associated Air Balance Council 1518 K Street, NW, Suite 503 Washington, DC 20005 <a href="http://www.aabchq.com">www.aabchq.com</a>	202/737-0202
AAMA	American Architectural Manufacturers Association 1827 Walden Office Sq., Suite 104 Schaumburg, IL 60173-4268 <a href="http://www.aamanet.org">www.aamanet.org</a>	847/303-5664
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, Suite 249 Washington, DC 20001 <a href="http://www.aashto.org">www.aashto.org</a>	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Drive Research Triangle Park, NC 27709-2215 <a href="http://www.aatcc.org">www.aatcc.org</a>	919/549-8141
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 <a href="http://www.aci-int.org">www.aci-int.org</a>	248/848-3700
ACPA	American Concrete Pipe Association 222 West Las Colinas Blvd., Suite 641 Irving, TX 75039-5423 <a href="http://www.concrete-pipe.org">www.concrete-pipe.org</a>	972/506-7216

ADC	Air Diffusion Council 11 South LaSalle St., Suite 1400 Chicago, IL 60603	312/201-0101
AFPA	American Forest and Paper Association 1111 19th St., NW, Suite 800 Washington, DC 20036	202/463-2700
AGA	American Gas Association 1515 Wilson Blvd. Arlington VA 22209 <a href="http://www.aga.com">www.aga.com</a>	703/841-8400
AHA	American Hardboard Association 1210 W. Northwest Hwy Palatine, IL 60067-1897	847/934-8800
AI	Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, KY 40512-4052 <a href="http://www.asphaltinstitute.org">www.asphaltinstitute.org</a>	606/288-4960
AIA	The American Institute of Architects 1735 New York Avenue, NW Washington, DC 20006-5292 <a href="http://www.aia.org">www.aia.org</a>	202/626-7300
AISC	American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001	800/644-2400
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy., Suite 140 Englewood, CO 80112 <a href="http://www.aitc-glulam.org">www.aitc-glulam.org</a>	303/792-9559
ALCA	Associated Landscape Contractors of America 12200 Sunrise Valley Drive, Suite 150 Reston, VA 20191 <a href="http://www.alca.org">www.alca.org</a>	703/620-6363

ALI	Associated Laboratories, Inc. P.O. Box 152837 1323 Wall St. Dallas, TX 75315	214/565-0593
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004-1893 <a href="http://www.amca.org">www.amca.org</a>	847/394-0150
ANLA	American Nursery and Landscape Association 1250 Eye Street, NW, Suite 500 Washington, DC 20005	202/789-2900
ANSI	American National Standards Institute 11 West 42nd Street, 13th Floor New York, NY 10036-8002 <a href="http://www.ansi.org">www.ansi.org</a>	212/642-4900
APA	APA-The Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700 <a href="http://www.apawood.org">www.apawood.org</a>	206/565-6600
APA	Architectural Precast Association P.O. Box 08669 Fort Myers, FL 33908-0669	941/454-6989
ARI	Air Conditioning and Refrigeration Institute 4301 Fairfax Drive, Suite 425 Arlington, VA 22203 <a href="http://www.ari.org">www.ari.org</a>	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association Center Park 4041 Powder Mill Road, Suite 404 Calverton, MD 20705	301/231-9050

ASA	Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797	516/576-2360
ASCE	American Society of Civil Engineers- World Headquarters 1801 Alexander Bell Drive Reston, VA 20190-4400 <a href="http://www.asce.org">www.asce.org</a>	800/548-2723 703/295-6000
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 <a href="http://www.ashrae.org">www.ashrae.org</a>	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 4401 Connecticut Ave., NW, 5th Floor Washington, DC 20008-2369 <a href="http://www.asla.org">www.asla.org</a>	202/686-2752
ASME	American Society of Mechanical Engineers 345 East 47 <sup>th</sup> Street New York, NY 10017-2392 <a href="http://www.asme.org">www.asme.org</a>	800/434-2763
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362-3649	805/495-7120
ASQC	American Society for Quality Control 611 E. Wisconsin Avenue Milwaukee, WI 53201-3005 <a href="http://www.asqc.org">www.asqc.org</a>	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 28901 Clemens Road Westlake, OH 44145 <a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>	216/835-3040
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 <a href="http://www.astm.org">www.astm.org</a>	610/832-9500

AWCI	Association of the Wall and Ceiling Industries--International 307 E. Annandale Road, Suite 200 Falls Church, VA 22042-2433 <a href="http://www.awci.org">www.awci.org</a>	703/534-8300
AWPA	American Wood-Preservers' Association 3246 Fall Creek Highway, Suite 1900 Granbury, TX 76049-7979	817/326-6300
AWS	American Welding Society 550 NW LeJeune Road Miami, FL 33126 <a href="http://www.amweld.org">www.amweld.org</a>	800/443-9373 305/443-9353
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 <a href="http://www.awwa.org">www.awwa.org</a>	800/926-7337 303/794-7711
BHMA	Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Floor New York, NY 10017-6603	212/661-4261
CBM	Certified Ballast Manufacturers Association 1422 Euclid Avenue, Suite 402 Cleveland, OH 44115-2094	216/241-0711
CGA	Compressed Gas Association 1725 Jefferson Davis Hwy, Suite 1004 Arlington, VA 22202-4102 <a href="http://www.cganet.com">www.cganet.com</a>	703/412-0900
CISCA	Ceilings & Interior Systems Construction Association 1500 Lincoln Hwy, Suite 202 St. Charles, IL 60174 <a href="http://www.cisca.org">www.cisca.org</a>	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 5959 Shallowford Road, Suite 419 Chattanooga, TN 37421	423/892-0137

CPSC	Consumer Product Safety Commission East West Towers 4330 East-West Hwy. Bethesda, MD 20814	800/638-2772
CPPA	Corrugated Polyethylene Pipe Association 432 N. Superior Street Toledo, OH 43604	800/510-2772 419/241-2221
CRA	California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949	415/382-0662
CRI	Carpet and Rug Institute 310 S. Holiday Avenue Dalton, GA 30722-2048 <a href="http://www.carpet-rug.com">www.carpet-rug.com</a>	800/882-8846 706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 <a href="http://www.crsi.org">www.crsi.org</a>	847/517-1200
CTI	Ceramic Tile Institute of America 12061 W. Jefferson Blvd. Culver City, CA 90230-6219	310/574-7800
DHI	Door and Hardware Institute 14170 Newbrook Drive Chantilly, VA 20151-2223 <a href="http://www.dhi.org">www.dhi.org</a>	703/222-2010
DIPRA	Ductile Iron Pipe Research Association 245 Riverchase Pkwy East, Suite O Birmingham, AL 35244	205/988-9870
DOC	Department of Commerce 14 <sup>th</sup> Street and Constitution Avenue, NW Washington, DC 20230	202/482-2000
DOT	Department of Transportation 400 Seventh Street, SW Washington, DC 20590	202/366-4000



EJMA	Expansion Joint Manufacturers Association 25 N. Broadway Tarrytown, NY 10591-3201	914/332-0040
EPA	Environmental Protection Agency 401 M Street, SW Washington, DC 20460	202/260-2090
FCICA	Floor Covering Installation Contractors Association P.O. Box 948 Dalton, GA 30722-0948	706/226-5488
FM	Factory Mutual 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062-9102 <a href="http://www.factorymutual.com">www.factorymutual.com</a>	781/255-4300
FS	Federal Specifications Unit (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407	202/619-8925
GA	Gypsum Association 810 First Street NE, Suite 510 Washington, DC 20002 <a href="http://www.usg.com">www.usg.com</a>	202/289-5440
GANA	Glass Association of North America 3310 SW Harrison Street Topeka, KS 66611-2279 <a href="http://www.glasswebsite.com/gana">www.glasswebsite.com/gana</a>	913/266-7013
HMA	Hardwood Manufacturers Association 400 Penn Center Blvd., Suite 530 Pittsburgh, PA 15235-5605 <a href="http://www.hardwood.org">www.hardwood.org</a>	412/828-0770
HPVA	Hardwood Plywood and Veneer Association 1825 Michael Farraday Drive P.O. Box 2789 Reston, VA 22195-0789 <a href="http://www.hpva.org">www.hpva.org</a>	703/435-2900

IEEE	Institute of Electrical and Electronic Engineers 345 E. 47 <sup>th</sup> Street New York, NY 10017-2394 <a href="http://www.ieee.org">www.ieee.org</a>	800/678-4333 212/705-7900
IESNA	Illuminating Engineering Society of North America 120 Wall Street, 17th Floor New York, NY 10005-4001 <a href="http://www.iesna.org">www.iesna.org</a>	212/248-5000
ITS	Intertek Testing Services P.O. Box 2040607/753-6711 3933 US Route 11 Cortland, NY 13045-7902 <a href="http://www.itsglobal.com">www.itsglobal.com</a>	800/345-3851
LMA	Laminating Materials Association 116 Lawrence Street Hillsdale, NJ 07642-2730 <a href="http://www.lma.org">www.lma.org</a>	201/664-2700
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850-4329	301/869-5800
ML/SFA	Metal Lath/Steel Framing Association (A Division of the NAAMM) 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603	312/456-5590
MSS	Manufacturers Standardization Society for the Valve and Fittings Industry 127 Park Street, NE Vienna, VA 22180-4602	703/281-6613
NAA	National Arborist Association P.O. Box 1094603/673-3311 Amherst, NH 03031-1094 <a href="http://www.natlarb.com">www.natlarb.com</a>	800/733-2622
NAAMM	National Association of Architectural Metal Manufacturers 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603 <a href="http://www.gss.net/naamm">www.gss.net/naamm</a>	312/782-5590

NAIMA	North American Insulation Manufacturers Association 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314 <a href="http://www.naima.org">www.naima.org</a>	703/684-0084
NAPA	National Asphalt Pavement Association NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	301/731-4748
NCSPA	National Corrugated Steel Pipe Association 1255 23rd Street, NW, Suite 850 Washington, DC 20037 <a href="http://www.ncspa.org">www.ncspa.org</a>	202/452-1700
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877-4121	301/977-3698
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814-5372	301/657-3110
NEI	National Elevator Industry 185 Bridge Plaza North, Suite 310 Fort Lee, NJ 07024	201/944-3211
NEMA	National Electrical Manufacturers' Association 1300 N. 17 <sup>th</sup> Street, Suite 1847 Rosslyn, VA 22209 <a href="http://www.nema.org">www.nema.org</a>	703/841-3200
NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 <a href="http://www.nfpa.org">www.nfpa.org</a>	800/344-3555 617/770-3000
NHLA	National Hardwood Lumber Association P.O. Box 34518 Memphis, TN 38184-0518 <a href="http://www.natlhardwood.org">www.natlhardwood.org</a>	901/377-1818

NIA	National Insulation Association 99 Canal Center Plaza, Suite 222 Alexandria, VA 22314 <a href="http://www.insulation.org">www.insulation.org</a>	703/683-6422
NPA	National Particleboard Association 18928 Premiere Court Gaithersburg, MD 20879-1569 <a href="http://www.pbmdf.com">www.pbmdf.com</a>	301/670-0604
NPCA	National Paint and Coatings Association 1500 Rhode Island Avenue, NW Washington, DC 20005-5597 <a href="http://www.paint.org">www.paint.org</a>	202/462-6272
NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 <a href="http://www.roofonline.org">www.roofonline.org</a>	800/323-9545
NRMCA	National Ready Mixed Concrete Association 900 Spring Street Silver Spring, MD 20910 <a href="http://www.nrmca.org">www.nrmca.org</a>	301/587-1400
NSF	NSF International P.O. Box 130140 Ann Arbor, MI 48113-0140 <a href="http://www.nsf.org">www.nsf.org</a>	313/769-8010
NUSIG	National Uniform Seismic Installation Guidelines 12 Lahoma Court Alamo, CA 94526	510/946-0135
NWWDA	National Wood Window and Door Association 1400 E. Touhy Avenue, G-54 Des Plaines, IL 60018 <a href="http://www.nwwda.org">www.nwwda.org</a>	800/223-2301
SHA	Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210	202/219-8148

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077-1083 <a href="http://www.portcement.org">www.portcement.org</a>	847/966-6200
PDCA	Painting and Decorating Contractors of America 3913 Old Lee Hwy, Suite 33-B Fairfax, VA 22030 <a href="http://www.pdca.com">www.pdca.com</a>	800/332-7322 703/359-0826
PDI	Plumbing and Drainage Institute 45 Bristol Drive, Suite 101 South Easton, MA 02375	800/589-8956 508/230-3516
RFCI	Resilient Floor Covering Institute 966 Hungerford Drive, Suite 12-B Rockville, MD 20805-1714	301/340-8580
RIS	Redwood Inspection Service c/o California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949-7206	415/382-0662
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60012 <a href="http://www.sdi.org">www.sdi.org</a>	847/462-1930
SDI	Steel Door Institute 30200 Detroit Road Cleveland, OH 44145-1967	216/889-0010
SMA	Stucco Manufacturers Association 14006 Ventura Blvd. Sherman Oaks, CA 91403	213/789-8733
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. P.O. Box 221230 Chantilly, VA 20151-1209 <a href="http://www.smacna.org">www.smacna.org</a>	703/803-2980

SPI	Society of the Plastics Industry, Inc. Spray Polyurethane Division 202/974-5200 1801 K Street, NW, Suite 600K Washington, DC 20006 <a href="http://www.socplas.org">www.socplas.org</a>	800/951-2001
SSPC	Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburgh, PA 15222-4643	412/281-2331
TCA	Tile Council of America 100 Clemson Research Blvd. Anderson, SC 29625	864/646-8453
TPI	Turfgrass Producers International 1855-A Hicks Road Rolling Meadows, IL 60008	800/405-8873 847/705-9898
UL	Underwriters Laboratories, Inc. 333 Pfingston Road 847/272-8800 Northbrook, IL 60062 <a href="http://www.ul.com">www.ul.com</a>	800/704-4050
UNI	Uni-Bell PVC Pipe Association 2655 Villa Creek Drive, Suite 155 Dallas, TX 75234 <a href="http://www.members.aol.com/unibell1">www.members.aol.com/unibell1</a>	972/243-3902
USDA	U.S. Department of Agriculture 14th St. and Independence Ave., SW Washington, DC 20250	202/720-8732
WA	Wallcoverings Association 401 N. Michigan Avenue Chicago, IL 60611-4267	312/644-6610
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281-3145	503/639-0651
WCMA	Window Covering Manufacturers Association 355 Lexington Ave., 17th Floor New York, NY 10017-6603	212/661-4261

WIC	Woodwork Institute of California P.O. Box 980247 West Sacramento, CA 95798-0247	916/372-9943
WLPDIA	Western Lath/Plaster/Drywall Industries Association 8635 Navajo Road San Diego, CA 92119	619/466-9070
WMMPA	Wood Moulding & Millwork Producers Association 507 First Street Woodland, CA 95695 <a href="http://www.wmmpa.com">www.wmmpa.com</a>	800/550-7889 916/661-9591
WRI	Wire Reinforcement Institute 203 Loudoun Street, SW Leesburg, VA 20175-2718	703/779-2339
WWPA	Western Wood Products Association Yeon Building 522 S.W. 5th Avenue Portland, OR 97204-2122	503/224-3930

END OF DOCUMENT

**DOCUMENT 01 43 00**

**QUALITY ASSURANCE - MATERIALS AND EQUIPMENT**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

**1.02 MATERIAL AND EQUIPMENT**

- A. Only items approved by the County and/or Architect shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

**1.03 MATERIAL AND EQUIPMENT COLORS**

- A. The County and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.



- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.
- D. Materials shall not be acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the County, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at no cost to County.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by County.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

### **2.02 FACILITIES AND EQUIPMENT**

- A. Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

## **2.03 MATERIAL REFERENCE STANDARDS**

- A. Where material is specified solely by reference to “standard specifications” and if requested by County, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

## **PART 3 - EXECUTION**

### **3.01 WORKMANSHIP**

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

### **3.02 COORDINATION**

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor’s failure to coordinate will be at no additional cost to County.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

### **3.03 COMPLETENESS**

- A. Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain system; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and

refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

### **3.04 APPROVED INSTALLER OR APPLICATOR**

- A. Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator that does not have other approved applicator work in progress or completed is not approved for this Project.

### **3.05 MANUFACTURER'S RECOMMENDATIONS**

- A. All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the County and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the County and/or the Architect.

END OF DOCUMENT

DOCUMENT 01 45 00

**QUALITY CONTROL**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

**1.02 RELATED CODES:**

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.

**1.03 OBSERVATION AND SUPERVISION:**

The County and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Engineer will be in accordance with applicable regulations.

**1.04 TESTING AGENCIES:**

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

**1.05 TESTS AND INSPECTIONS:**

- A. The Contractor shall be responsible for notifying the Construction Manager of all required tests and inspections. Contractor shall notify the County Project Manager **forty-eight (48) hours in advance of performing any Work requiring testing or inspection.**
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The County will pay for first inspections and tests required by the “CCR”, and other inspections or tests that the County and/or the Architect may direct to have made, including the following principal items:
  - (1) Tests and observations for earthwork and paving.
  - (2) Tests for concrete mix designs, including tests of trial batches.
  - (3) Tests and inspections for structural steel work.
  - (4) Field tests for framing lumber moisture content.
  - (5) Additional tests directed by the County that establish that materials and installation comply with the Contract Documents.
  - (6) Test and observation of welding and expansion anchors.
- D. The County may at its discretion, pay and back charge the Contractor for:
  - (1) Retests or re-inspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
  - (2) Uncovering of work in accordance with Contract Documents.
  - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
  - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:

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

## PART 2 - PRODUCTS

### 2.01 TYPE OF TEST AND INSPECTIONS (As Applies to the Project):

- A. Slump Test  
ASTM C 143
- B. Concrete Tests  
Testing agency shall test concrete used in the work per the following paragraphs:
  - (1) Compressive Strength:
    - a. Minimum number of tests required: **One (1) set of three (3) cylinders for each 100 cubic yards** (Sec. 2604(h) 01) **of concrete** or major fraction thereof, **placed in one (1) day**. See Title 24, Section 2605(g).
    - b. **Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve** and tested only when directed by the Architect or County.
    - c. Concrete shall test the **minimum ultimate compressive strength in 28 days**, as specified on the structural drawings.
    - d. In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall

be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.

- e. In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect.

C. Reinforcing, Steel

D. Structural Steel Per Title 24 and as noted:

- (1) Material: Steel per Table in Title 24, Section 2712.
- (2) Qualification of Welders (UBC Std. 27-6).
- (3) Shop fabrication (Section 2712(d). Structural steel only).
- (4) Shop and field welding (Section 2712(e)).

END OF DOCUMENT

DOCUMENT 01 50 00

**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions
- B. Special Conditions
- C. Site Standards

**1.02 TEMPORARY UTILITIES:**

- A. Electric Power and Lighting
  - (1) The County will furnish and pay for power during the course of the work to the extent power is available in the building(s) or on the Site. The Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
  - (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
  - (3) The Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: **a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.**
- B. Heat and Ventilation
  - (1) Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to improper temperature and



humidity conditions. Portable heaters shall be standard units complete with controls.

- (2) Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.
- (3) Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

**C. Water**

- (1) The County will furnish and pay for water during the course of the work to the extent water is then available in the building(s) or on the Site. The Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall use backflow preventers on water lines at point of connection to County's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

**D. Sanitary Facilities**

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the County for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the County or Contractor completes all work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by written consent of the County.

**E. Telephone Service**

- (1) Contractor shall arrange with local telephone service company for telephone service for the performance of the Work. Contractor shall, at a minimum, provide in its field office one line for telephone and one line for fax machine.

- (2) Contractor shall pay the costs for telephone and fax lines installation, maintenance, service, and removal.

**F. Fire Protection:**

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

**G. Trash Removal:**

- (1) See Document 01 74 19

**1.03 CONSTRUCTION AIDS:**

**A. Plant and Equipment:**

- (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workmen. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
- (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the County.

- B.** None of the County's tools and equipment shall be used by Contractor for the performance of the Work.

**1.04 BARRIERS AND ENCLOSURES:**

- A.** Contractor shall obtain the County's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B.** Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements,

persons, and trees and plants from damage and injury from demolition and construction operations.

- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
  - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
  - (2) Contractor shall provide barriers to a **minimum height of 4'-0" around drip line of each tree and plant**, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations.
  - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the County and at Contractor's expense, either be replaced with new plant materials equal in size to those damaged or by payment of an amount representing the value of the damaged materials as determined by the County.
  - (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
  - (5) Excavation Around Trees:
    - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the County.
    - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the County. Main lateral roots and taproots shall not be cut. **All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap** so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by

the County. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.

- (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, **roots shall be cut approximately 6 inches back from new construction.**
- (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
- (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped **with four layers of wet, untreated burlap and temporarily supported and protected** from damage until permanently relocated and covered with backfill.
- (f) Accidentally broken roots should be **sawed cleanly 3 inches behind ragged end.**

#### 1.05 SECURITY AND PARKING:

- A. The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.
- B. Contractor is responsible for any charges associated with parking of Contractor and Contractor employee's vehicles either at County facilities or off-site. Unless otherwise stated, all parking at County facilities requires payment.

#### 1.06 TEMPORARY CONTROLS:

- A. Noise Control
  - (1) Contractor acknowledge, that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.

- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the County for written approval a **minimum of forty-eight (48) hours in advance of their performance.**

B. Noise and Vibration

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with County to minimize and/or seize the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water

Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.

- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

**1.07 JOB SIGN(S):**

A. General:

- (1) If required, contractor shall provide and maintain a Project identification sign with the design, text, and colors designated by the County and/or the Architect; locate sign as approved by the County.
- (2) Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in writing in advance by the County.

B. Materials:

- (1) Structure and Framing: Structurally sound, new or used wood or metal; wood shall be nominal 3/4-inch exterior grade plywood.
- (2) Sign Surface: **Minimum 3/4-inch exterior grade plywood.**
- (3) Rough Hardware: Galvanized.
- (4) Paint: Exterior quality, of type and colors selected by the County and/or the Architect.

C. Fabrication:

- (1) Contractor shall fabricate to provide smooth, even surface for painting.
- (2) Size: 4'-0" x 8'-0", unless otherwise indicated.
- (3) Contractor shall paint exposed surfaces of supports, framing, and surface material with exterior grade paint: one coat of primer and one coat of finish paint.
- (4) Text and Graphics: As indicated.

**1.08 PUBLICITY RELEASES:**

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s).

**END OF DOCUMENT**

DOCUMENT 01 62 00

**PRODUCT OPTIONS AND SUBSTITUTIONS**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items;
- C. Special Conditions.
- D. LEED™ Requirements Document 01 35 13.23

**1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT:**

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the County and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions.
- D. If the County and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the County and/or



Architect to be unacceptable, the specified material or equipment shall be provided.

- E. Samples may be required. Tests required by the County and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the County.
- F. In reviewing the supporting data submitted for substitutions, the County and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. **If more than two (2) submissions of supporting data are required**, the cost of reviewing the additional supporting data shall be borne by Contractor, and the County will deduct the costs from the Contract Price.

END OF DOCUMENT

DOCUMENT 01 65 00

## **DELIVERY, STORAGE AND HANDLING**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISIONS**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

#### **1.02 PRODUCTS**

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

#### **1.03 TRANSPORTATION AND HANDLING**

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

#### **1.04 STORAGE AND PROTECTION**

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.

- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.
- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

END OF DOCUMENT

DOCUMENT 01 71 23

## **FIELD ENGINEERING**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

#### **1.02 REQUIREMENTS INCLUDED:**

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
  - (1) Survey work required in execution of the Project.
  - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

#### **1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:**

- A. Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom County makes no objection.

#### **1.04 SURVEY REFERENCE POINTS:**

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
  - (1) Make no changes or relocation without prior written notice to County and Architect.

- (2) Report to County and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

**1.05 RECORDS:**

- A. Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

**1.06 SUBMITTALS:**

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to County and Architect prior to its/their work on the Project.
- B. On request of County and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the County.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

**PART 2 – PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

- 3.01 Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.
- 3.02 Contractor is responsible for any re-surveying required by correction of non-conforming work.

END OF DOCUMENT

DOCUMENT 01 73 29

## **CUTTING AND PATCHING**

### **1. PART 1 – GENERAL**

#### **1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Hazardous Materials Procedures and Requirements;
- D. Hazardous Materials Certification;
- E. Imported Materials Certification.

#### **1.02 CUTTING AND PATCHING:**

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
  - (1) Make several parts fit together properly.
  - (2) Uncover portions of Work to provide for installation of ill-timed Work.
  - (3) Remove and replace defective Work.
  - (4) Remove and replace Work not conforming to requirements of Contract Documents.
  - (5) Remove Samples of installed Work as specified for testing.
  - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
  - (7) Attach new materials to existing remodeling areas, including painting (or other finishes) to match existing conditions.

- B. In addition to Contract requirements, upon written instructions from the County, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by County; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

**1.03 SUBMITTALS:**

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to County pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
  - (1) The Work of the County or other trades.
  - (2) Structural value or integrity of any element of Project.
  - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
  - (4) Efficiency, operational life, maintenance or safety of operational elements.
  - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
  - (1) Identification of Project.
  - (2) Description of affected Work.
  - (3) Necessity for cutting, alteration, or excavations.
  - (4) Effects of Work on County, other trades, or structural or weatherproof integrity of Project.
  - (5) Description of proposed Work:
    - (a) Scope of cutting, patching, alteration, or excavation.

- (b) Trades that will execute Work.
- (c) Products proposed to be used.
- (d) Extent of refinishing to be done.
- (6) Alternates to cutting and patching.
- (7) Cost proposal, when applicable.
- (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
- (9) Written permission of other trades whose Work will be affected.

**1.04 QUALITY ASSURANCE:**

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the County's decision shall be final.

**1.05 PAYMENT FOR COSTS:**

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the County, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the County.
- B. County shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the County, other than defective or nonconforming Work, will be paid by County on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

**PART 2 - PRODUCTS**



**2.01 MATERIALS:**

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the County.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

**PART 3 – EXECUTION**

**3.01 INSPECTION:**

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.
- B. Contractor shall report unsatisfactory or questionable conditions in writing to County as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by County.

**3.02 PREPARATION:**

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

**3.03 ERECTION, INSTALLATION AND APPLICATION:**

- A. With respect to performance, Contractor shall:

- (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
  - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
  - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage to settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
- (1) Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.
  - (2) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.
- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

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SECTION 01 74 19

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**CONSTRUCTION WASTE MANAGEMENT**

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**PART 1 – GENERAL**

1.01 SUMMARY

- A. This section specifies the requirements for the diversion of demolition (non-hazardous) and construction debris from landfill and submittal of the Waste Management Plan.
- B. Performance Requirement: Divert a **minimum of 65% of construction and demolition (non-hazardous) debris from landfill**. Diversion of 75% of the construction & demolition debris is the project goal.

1.03 DEFINITIONS

- A. "Conversion Rate" means the rate set forth in the standardized Conversion Rate Table approved by the County of Alameda for use in estimating the weight of materials identified in the Waste Management Plan and Waste Management Table.
- B. "Divert" means to use material for any purpose other than disposal in a landfill or transfer facility.
- C. "Good faith" shall be as defined by law.
- D. "Recycling Service" means an off-site service that provides processing of material and diversion from landfill.
- E. "Hauler" means the entity who transports construction and demolition debris to either a landfill or a recycling service.
- F. "Recycling Wizard" means an online database maintained by StopWaste.Org of approved recycling vendors that can be accessed at [www.StopWaste.Org](http://www.StopWaste.Org) or by calling 1-877-STOPWASTE.
- G. "Waste Management Plan" or "Plan" means a waste management plan required under this contract that is used to track and report the means of disposal of all construction debris generated on this project.
- H. "WasteTracking.com powered by Green Halo Systems" means the web based system required for use in developing a waste management plan, uploading recycling data throughout the construction process and submitting the final report demonstrating the project compliance online. More information about WasteTracking.com powered by Green Halo Systems is available by visiting them online at [www.wastetracking.com](http://www.wastetracking.com) or calling (888) 525-1301.

1.04 QUALITY ASSURANCE

- A. The Contractor shall obtain all special permits and licenses and meet all special requirements for performance and completion of the work of this section.
- B. Regulatory requirements
  - 1. Approval of the Waste Management Plan and Waste Management Table using the WasteTracking.com powered by Green Halo Systems by the Owner's Representative is required before beginning construction or demolition.
- C. Recycling service company qualifications – Submit certification for recycling services listed in the approved Waste Management Plan that accepted waste will be diverted from landfill. Certification shall be demonstrated in one of the following ways:
  - 1. Recycling service is listed in the Green Halo System as an approved recycler for Alameda County projects; or
  - 2. Recycling service is listed within Alameda County Waste Management Authority's Recycling Wizard, a Directory of where to recycle construction and demolition debris materials, or equivalent database/listing at StopWaste.Org. A database of construction and demolition recyclers can be found at [www.StopWaste.Org](http://www.StopWaste.Org) or can be obtained by calling 1-877-STOPWASTE; or
  - 3. If not listed as described in items 1 and 2 above, submit certification in writing from any recycling services that verifies accepted waste will be diverted from landfill.

#### 1.05 SUBMITTALS

- A. Submit specified Waste Management Plan to indicate how waste will be diverted from landfills. Plan to include procedures and schedule for debris disposal. Submittal shall be made using WasteTracking.com powered by Green Halo Systems using the following URL: [ACGSA.WasteTracking.com](http://ACGSA.WasteTracking.com). Submittal is required **within 7 calendar days after receipt of Notice to Proceed**; and
- B. Submit written documentation from recycling services that are not listed in the WasteTracking.com powered by Green Halo Systems or the Stopwaste.Org Recycling Wizard identifying where the construction and demolition material is taken, what method or process is being used to recycle the material, and identifying applicable state and local permits held by the recycling service provider and recycling facility; and
- C. Submit completed Waste Management Plan to report on the means of disposal of waste generated from project at the following project milestones:
  - 1. **Fifty (50) percent progress payment**; and
  - 2. **One hundred (100) percent construction complete**. County approval of final Waste Management Plan is required before full release of retention.

1.06 WASTE MANAGEMENT PLAN

- A. Plan Development: Using the website [ACGSA.WasteTracking.com](http://ACGSA.WasteTracking.com) develop a plan for diverting the specified percentage of construction debris from landfill. The plan shall include the following:
1. Submit **within 7-calendar days after receipt of Notice to Proceed**.
  2. Propose means and methods for collecting and separating each type of debris deemed reusable or recyclable.
  3. Identify the off-site recycling service and hauler of each designated debris item, who has agreed to accept and divert that item from landfill, in the proposed quantities anticipated. Schedule each item and list off-site recycling service and hauler company name, telephone number, address, and person contacted.
  4. Include a "good faith" estimate of each type of construction waste that would be generated if no diversion methods were implemented. Submit with calculations based upon weight or volume of each. The following items are subject to the "good faith" estimate and diversion requirement:
    - a. Asphalt & Concrete
    - b. Brick/Masonry/Tiles
    - c. Building Materials (doors, windows, fixtures, etc.)
    - d. Cardboard and other paper products
    - e. Carpet/Carpet Padding/Foam
    - f. Ceiling Tiles (acoustic)
    - g. Drywall
    - h. Electrical Components (light fixtures, cables, etc)
    - i. Film Plastic & Styrofoam Blocks
    - j. Landscape Debris (Plant & tree trimmings)
    - k. Mechanical Debris (ducts, controls, plumbing fixtures, etc)
    - l. Scrap Metal
    - m. Unpainted Wood and Pallets
    - n. Other (painted wood & drywall, roofing, etc)
    - o. Mixed C&D (defined as a mixture of three or more materials from construction or demolition sites that will be taken to a "qualified" facility for recycling.)
    - p. Trash/garbage
  5. Construction waste quantities entered in volume will be converted automatically using the defined Conversion Rate approved by Alameda County that is integrated into WasteTracking.com powered by Green Halo Systems.
- B. Plan Implementation
1. Contractor shall do all of the following:
    - a. Retain a copy of, and upload into WasteTracking.com powered by Green Halo Systems, all weight tickets, copies of receipts and invoices and any other documentation related to the reuse, recycling,

- and disposal of generated waste/debris from demolition and construction activities; and
- b. Maintain a 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.
    - 1) Include in log: type of load, load weight, name of hauling service, name of recycling service or landfill, and date accepted by recycling service or by landfill.
    - 2) Owner reserves the right to audit the log at any time. Contractor shall retain and provide to the Owner all weight tickets, copies of receipts and invoices and any other documentation related to the disposal or recycling of generated waste/debris from demolition and construction activities.
  - c. Units of measure: Use same units as stated in the approved plan "good faith" estimate of construction waste that would be generated if no remedial methods were implemented.
2. Material handling
- a. Separation facilities
    - 1) Designate a specific on site area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return.
    - 2) Keep waste bins and pile areas neat and clean. Clearly mark bins for each category of waste. Do not co-mingle non-recyclable waste with materials designated for reuse or recycling.
  - b. Environmental controls during handling, storage, or transport: Do not permit designated materials to become contaminated or to contaminate site or surrounding areas.
3. Training and coordination
- a. Provide access and training as needed to subcontractors to the online construction and demolition debris waste management tool Green Halo Systems for the purposes of input of waste management information.
  - b. Furnish copies of the Waste Management Plan to all on-site supervisors, each subcontractor, and the Owner.
  - c. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all entities at the appropriate stages of the Project.
  - c. Meetings: Include construction waste management on the agenda of meetings. At a minimum, discuss waste management goals and issues at the following meetings:

- 1) Pre-bid meetings.
- 2) Pre-construction meeting.
- 3) Regularly scheduled job-site meetings.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS, EQUIPMENT AND FACILITIES**

Furnish all materials, tools, equipment, devices, appurtenances, facilities, and services required for performing waste management of debris covered under this Section.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION AND PREPARATION**

- A. Set up and maintain in good standing a project account with WasteTracking.com powered by Green Halo Systems using the website [ACGSA.WasteTracking.com](http://ACGSA.WasteTracking.com) to be used exclusively for this project to develop a waste management plan, upload all reuse, recycling and waste disposal data throughout the construction process and submit the final online report demonstrating project compliance.
- B. Perform as required in the approved Waste Management Plan.

### **3.02 DISPOSAL OF DEBRIS**

- A. Dispose of waste, trash and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Burying of trash and debris on the site is prohibited.
- B. Remove demolished materials from site as work progresses. Remove debris from the site so that its presence will not delay the progress of the work.
- C. Debris shall be the property of the Contractor and shall be removed and disposed of in a legal manner off the County's property in accordance with the approved Waste Management Plan described herein. Location of recycling facility or dump and length of haul shall be the Contractor's responsibility.

**END OF SECTION**

DOCUMENT 01 76 00

**PROTECTING INSTALLED CONSTRUCTION**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions.

**PART 2 - PRODUCTS**

**2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:**

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

**PART 3 - EXECUTION**

**3.01 EXAMINATION:**

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

**3.02 PREPARATION:**

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without



limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.
- E. Contractor shall close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Contractor shall insulate ductwork and piping to prevent condensation in exposed areas. Contractor shall insulate building cavities for thermal and/or acoustical protection, as detailed.

### **3.03 INSTALLATION:**

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate County occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, mechanical work and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

### **3.04 TRANSITIONS:**

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the County and the Architect for review and approval.

### **3.05 ADJUSTMENTS:**

- A. Where removal of partitions or walls results in adjacent spaces becoming one, Contractor shall rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- B. Where a **change of plane of 1/4 inch or more** occurs, Contractor shall submit a recommendation for providing a smooth transition to the County and the Architect for review and approval.
- C. Contractor shall trim existing doors as necessary to clear new floor finish and refinish trim as required.
- D. Contractor shall fit Work at penetrations of surfaces.

**3.06 REPAIR OF DAMAGED SURFACES:**

- A. Contractor shall patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Contractor shall repair substrate prior to patching finish.

**3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:**

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified the Contract Documents, including without limitation, the Drawings.

**3.08 FINISHES:**

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

**3.09 CLEANING:**

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

**SECTION 01 77 00**

**CONTRACT CLOSE-OUT**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Construction Facilities and Temporary Controls.

**1.02 CLOSE-OUT PROCEDURES**

Contractor shall comply with all close-out provisions as indicated in the General Conditions.

**1.03 FINAL CLEANING**

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site.

**1.04 ADJUSTING**

- A. Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Record Documents and Shop Drawings: Contractor shall legibly mark each item to record actual construction, including:
  - (1) Measured depths of foundations in relation to finish floor datum.
  - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - (4) Field changes of dimension and detail.
  - (5) Details not on original Contract Drawings.
  - (6) Changes made by modification(s).
  - (7) References to related Shop Drawings and modifications.
- C. County will provide one set of reproducible drawings to Contractor.
- D. Contractor shall submit all required documents to County and/or Architect prior to, or with its, final Application for Payment.

**1.06 INSTRUCTION OF COUNTY PERSONNEL:**

- A. Before final inspection, at agreed upon times, Contractor shall instruct County's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons **within six months**.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

- E. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

**1.07 SPARE PARTS AND MAINTENANCE MATERIALS:**

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.
- B. Contractor shall provide County all required Operation and Maintenance Data.

**PART 2 – PRODUCTS**

Not used.

**PART 3 – EXECUTION**

Not used.

END OF DOCUMENT

**DOCUMENT 01 78 23**

**OPERATION AND MAINTENANCE INSTRUCTIONS**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS AND PROVISIONS:**

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

**1.02 QUALITY ASSURANCE:**

- A. Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

**1.03 FORMAT:**

- A. Contractor shall prepare data in the form of an instructional manual entitled “OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS” (“Manual”).
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

**1.04 CONTENTS, EACH VOLUME:**

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, sub-consultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: The Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

**1.05 MANUAL FOR MATERIALS AND FINISHES:**

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.



- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

#### 1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.
- C. Contractor shall include **color coded wiring diagrams as installed.**
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with **color coded piping diagrams as installed.**
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

**1.08 SUBMITTAL:**

- A. Contractor shall submit to the County for review a copy of the preliminary draft or proposed formats and outlines of the contents of the Manual **within thirty (30) days of Contractor's start of Work.**
- B. For equipment, or component parts of equipment put into service during construction and to be operated by County, Contractor shall submit draft content for that portion of the Manual **within ten (10) days after acceptance of that equipment or component.**
- C. Contractor shall **submit two (2) copies of a complete Manual in final form prior to final Application for Payment.** Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by County prior to County's approval of Contractor's final Application for Payment.
- D. Contractor must **submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.**

END OF DOCUMENT

DOCUMENT 01 78 36

## WARRANTIES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

#### 1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier, and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

#### 1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), **within ten (10) days after completion of the applicable item or work.** Except for items put into use with County's permission, Contractor shall **leave blank the date of beginning of time of warranty until the date of completion is determined.**

- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

**1.04 TIME OF SUBMITTALS:**

- A. For equipment or component parts of equipment put into service during construction with County's permission, Contractor shall submit a draft warranty for that equipment or component **within ten (10) days after acceptance of that equipment or component.**
- B. Contractor shall submit for County approval all warranties and related documents **within ten (10) days after date of completion.** Contractor must revise the warranties as required by the County prior to County's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, provide updated submittal **within ten days after acceptance, listing the date of project completion** as start of warranty period.

END OF DOCUMENT

DOCUMENT 01 78 39

## PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

### PART 2 - RECORD DRAWINGS

#### 2.01 GENERAL:

- A. As indicated in the Contract Documents, the County will provide Contractor with one set of prints of the original Contract Drawings.
- B. Contractor shall maintain at the Project Site one set of marked-up prints and each month, or as otherwise agreed, shall transfer all changes and information to those marked-up prints. Contractor shall submit to the County Project Manager one set of final prints of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The Record Drawings shall be available at the Project Site. The Contractor shall submit **three (3) sets of final approved prints** at the conclusion of the Project following review of the prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by, without limitation, Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

#### 2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
- (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.
  - (2) Actual numbering of each electrical circuit.
  - (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
  - (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
  - (5) Installed location of all cathodic protection anodes.
  - (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
  - (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub-outs, invert elevations, etc.
  - (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy. In some instances, this may be by dimension, in others, it may be in relation to the spaces in the building near which it was installed.
- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide record drawing prints, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."

### **PART 3 - RECORD SPECIFICATIONS**

#### **3.01 GENERAL:**

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.

### **PART 4 - MAINTENANCE OF RECORD DOCUMENTS**

#### **4.01 GENERAL**

- A. Contractor shall store Record Documents apart from documents used for construction:
  - (1) Provide files and racks for storage of Record Documents.
  - (2) Maintain Record Documents in a clean, dry, legible condition and in good order.
- B. Do not use Record Documents for construction purposes.

END OF DOCUMENT

DOCUMENT 01 91 13

**GENERAL COMMISSIONING REQUIREMENTS**

PART 1 - GENERAL

1.01 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.
- B. Section intentionally omitted.

1.02 SUMMARY

- A. This Section includes general requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. Related Sections include the following:
  - 1. See Mechanical drawings and specifications for specific requirements for commissioning HVAC systems.

1.2 DEFINITIONS

- A. BoD: Basis of Design.
- B. CxA: Commissioning Authority.
- C. OPR: Owner's Project Requirements.
- D. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- E. TAB: Testing, Adjusting, and Balancing.

1.3 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate.
- B. Members Appointed by Owner:



1. Section intentionally omitted.
2. Representatives of the facility user and operation and maintenance personnel.
3. Architect and engineering design professionals.

#### **1.4 OWNER'S RESPONSIBILITIES**

- A. Provide documentation to the Contractor for use in developing the commissioning plan; systems manual; operation and maintenance training plan; and testing plans and checklists.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:
  1. Coordination meetings.
  2. Training in operation and maintenance of systems, subsystems, and equipment.
  3. Testing meetings.
  4. Demonstration of operation of systems, subsystems, and equipment.
- C. Provide utility services required for the commissioning process.
- D. Provide documents, prepared by Architect and approved by Owner, to the Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

#### **1.5 CONTRACTOR'S RESPONSIBILITIES**

- A. Provide utility services required for the commissioning process.
- B. Contractor shall assign representatives with expertise and authority to act on behalf of the Contractor and schedule to participate in and perform commissioning team activities including, but not limited to, the following:
  1. Participate in construction-phase coordination meetings.
  2. Participate in maintenance orientation and inspection.
  3. Participate in operation and maintenance training sessions.
  4. Participate in final review at acceptance meeting.
  5. Certify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.
  6. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
  7. Provide final commissioning documentation.
- C. Subcontractors shall assign representatives with expertise and authority to act on behalf of subcontractors and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
  1. Participate in construction-phase coordination meetings.

2. Participate in maintenance orientation and inspection.
3. Participate in procedures meeting for testing.
4. Participate in final review at acceptance meeting.
5. Provide schedule for operation and maintenance data submittals, equipment start-up, and testing for incorporation into the commissioning plan. Update schedule on a weekly basis throughout the construction period.
6. Provide information for developing construction-phase commissioning plan.
7. Participate in training sessions for Owner's operation and maintenance personnel.
8. Provide updated Project Record Documents to the General Contractor on a daily basis.
9. Gather and submit operation and maintenance data for systems, subsystems, and equipment, as specified in Division 1 Section "Operation and Maintenance Data."
10. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures and participate in testing of installed systems, subsystems, and equipment.

#### 1.6 CONTRACTOR'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Prepare a construction-phase commissioning plan. Collaborate with subcontractors to develop test and inspection procedures. Include design changes and scheduled commissioning activities coordinated with overall Project schedule. Identify commissioning team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task.
- C. Review and comment on submittals from each subcontractor for compliance with the Contract Documents, and construction-phase commissioning plan. Review and comment on performance expectations of systems and equipment and interfaces between systems.
- D. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The Contractor shall prepare and distribute minutes to commissioning team members and attendees **within five (5) workdays of the commissioning meeting.**
- E. At the beginning of construction, conduct an initial construction coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals; operation and maintenance training sessions; TAB Work; and Project completion.
- F. Observe and inspect construction and report progress and deficiencies. In addition to compliance with the Contract Documents, inspect systems and equipment installation for adequate accessibility for maintenance and component replacement or repair.

- G. Prepare Project-specific test and inspection procedures and checklists.
- H. Schedule, direct, witness, and document tests, inspections, and systems start-up.
- I. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- J. Certify date of acceptance and start-up for each item of equipment for start of warranty periods.
- K. Review Project Record Documents for accuracy. Request revisions from subcontractors to achieve accuracy. Project Record Documents requirements are specified in Division 1 Section "Project Record Documents".
- L. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the Contract Documents. Operation and maintenance documentation requirements are specified in Division 1 Section "Operation and Maintenance Data".
- M. Prepare operation and maintenance training program and provide qualified instructors to conduct operation and maintenance training. Operation and maintenance training is specified in Division 1 Section "Demonstration and Training".
- N. Videotape and edit training sessions.
- O. Videotape construction progress including hidden shafts.
- P. Prepare commissioning reports.
- Q. Assemble the final commissioning documentation, including the commissioning report and Project Record Documents.

#### **1.7 COMMISSIONING DOCUMENTATION**

- A. Index of Commissioning Documents: Contractor shall prepare an index to include storage location of each document.
- B. **Section intentionally omitted.**
- C. **Section intentionally omitted.**
- D. Commissioning Plan: A document, prepared by Contractor, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited to the following:
  - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the

- commissioning processes. Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.
2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
  3. Identification of systems and equipment to be commissioned.
  4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
  5. Identification of items that must be completed before the next operation can proceed.
  6. Description of responsibilities of commissioning team members.
  7. Description of observations to be made.
  8. Description of requirements for operation and maintenance training, including required training materials.
  9. Description of expected performance for systems, subsystems, equipment, and controls.
  10. Schedule for commissioning activities with specific dates coordinated with overall construction schedule.
  11. Identification of installed systems, subsystems, and equipment, including design changes that occurred during construction.
  12. Process and schedule for documenting changes on a continuous basis to appear in Project Record Documents.
  13. Process and schedule for completing pre-start and start-up checklists for systems, subsystems, and equipment to be verified and tested.
  14. Step-by-step procedures for testing systems, subsystems, and equipment with descriptions for methods of verifying relevant data, recording the results obtained, and listing parties involved in performing and verifying tests.
- E. Test Checklists: Contractor, with assistance of Architect/Engineer, shall develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. Prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Provide space for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in Division 1 Section "HVAC Commissioning Requirements". Each checklist, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:
1. Name and identification code of tested item.
  2. Test number.
  3. Time and date of test.
  4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
  5. Dated signatures of the person performing test and of the witness, if applicable.
  6. Individuals present for test.
  7. Deficiencies.
  8. Issue number, if any, generated as the result of test.

- F. Certificate of Readiness: Certificate of Readiness shall be signed by Contractor, Subcontractor(s), and Installer(s), certifying that systems, subsystems, equipment, and associated controls are ready for testing. Completed test checklists signed by the responsible parties shall accompany this certificate.
- G. Test and Inspection Reports: Contractor shall record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application shall be included with data. Contractor shall compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.
- H. Corrective Action Documents: Contractor shall document corrective action taken for systems and equipment that fail tests. Include required modifications to systems and equipment and revisions to test procedures, if any. Retest systems and equipment requiring corrective action and document retest results.
- I. Issues Log: Contractor shall prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the Contract Documents. Identify and track issues as they are encountered, documenting the status of unresolved and resolved issues.
  - 1. Creating an Issues Log Entry:
    - a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
    - b. Assign a descriptive title of the issue.
    - c. Identify date and time of the issue.
    - d. Identify test number of test being performed at the time of the observation, if applicable, for cross-reference.
    - e. Identify system, subsystem, and equipment to which the issue applies.
    - f. Identify location of system, subsystem, and equipment.
    - g. Include information that may be helpful in diagnosing or evaluating the issue.
    - h. Note recommended corrective action.
    - i. Identify commissioning team member responsible for corrective action.
    - j. Identify expected date of correction.
    - k. Identify person documenting the issue.
  - 2. Documenting Issue Resolution:
    - a. Log date correction is completed or the issue is resolved.
    - b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.
    - c. Identify changes to the Contract Documents that may require action.
    - d. State that correction was completed and system, subsystem, and equipment is ready for retest, if applicable.
    - e. Identify person(s) who corrected or resolved the issue.

- f. Identify person(s) documenting the issue resolution.
3. Issues Log Report: On a periodic basis, but not less than for each commissioning team meeting, Contractor shall prepare a written narrative for review of outstanding issues and a status update of the issues log. As a minimum, Contractor shall include the following information in the issues log and expand it in the narrative:
  - a. Issue number and title.
  - b. Date of the identification of the issue.
  - c. Name of the commissioning team member assigned responsibility for resolution.
  - d. Expected date of correction.
- J. Commissioning Report: Contractor shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report shall indicate whether systems, subsystems, and equipment have been completed and are performing according to the Contract Documents. The commissioning report shall include, but is not limited to, the following:
  1. Lists and explanations of substitutions; compromises; variances in the Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. This report shall be used to evaluate systems, subsystems, and equipment and shall serve as a future reference document during Owner occupancy and operation. It shall describe components and performance that exceed requirements of the Contract Documents and those that do not meet requirements of the Contract Documents. It may also include a recommendation for accepting or rejecting systems, subsystems, and equipment.
  2. **Section intentionally omitted.**
  3. Commissioning plan.
  4. Testing plans and reports.
  5. Corrective modification documentation.
  6. Issues log.
  7. Completed test checklists.
  8. Listing of off-season test(s) not performed and a schedule for their completion.
- K. Systems Manual: Contractor shall gather required information and compile systems manual. Systems manual shall include, but is not limited to, the following:
  1. **Section intentionally omitted.**
  2. Project Record Documents as specified in Division 1 Section "Project Record Documents".
  3. Final commissioning plan.
  4. Commissioning report.
  5. Operation and maintenance data as specified in Division 1 Section "Operation and Maintenance Data".

## 1.8 SUBMITTALS

- A. Commissioning Plan Pre-final Submittal: Contractor shall **submit two (2) hard copies of pre-final commissioning plan to Owner**. Deliver one copy to Owner, and one to Architect. Present submittal in sufficient detail to evaluate data collection and arrangement process. One copy, with review comments, will be returned to the Contractor for preparation of the final construction-phase commissioning plan.
- B. Commissioning Plan Final Submittal: Contractor shall **submit two (2) hard copies and two sets of electronically formatted information of final commissioning plan**. Deliver both hard copies and one set of discs to Owner. The final submittal must address previous review comments. The final submittal shall include a copy of the pre-final submittal review comments along with a response to each item.
- C. Test Checklists and Report Forms: Contractor shall submit sample checklists and forms to subcontractors for review and comment. Submit copies of each checklist and report form.
- D. Certificates of Readiness: Contractor shall submit Certificates of Readiness.
- E. Test and Inspection Reports: Contractor shall submit test and inspection reports.
- F. Corrective Action Documents: Contractor shall submit corrective action documents.
- G. Pre-final Commissioning Report Submittal: Contractor shall **submit two (2) hard copies of the pre-final commissioning report to Owner**. Include a copy of the preliminary submittal review comments along with Contractor's response to each item. Contractor shall deliver one copy to Owner and one copy to Architect. One copy, with review comments, will be returned to the Contractor for preparation of final submittal.
- H. Final Commissioning Report Submittal: Contractor shall **submit two (2) hard copies and two (2) sets of electronically formatted information of the final commissioning report**. Contractor shall deliver both hard copies and one set of discs to Owner. The final submittal must address previous review comments and shall include a copy of the pre-final submittal review comments along with a response to each item.

## 1.9 QUALITY ASSURANCE

- A. Instructor Qualifications: Factory-authorized service representatives, experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
- B. Test Equipment Calibration: Comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been **calibrated within six months prior to use**.



#### 1.10 COORDINATION

- A. Coordinating Meetings: Contractor shall **conduct bi-monthly coordination meetings** of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- B. Pretesting Meetings: Contractor shall conduct pretest meetings of the commissioning team to review start-up reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.
- C. Testing Coordination: Contractor shall coordinate sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- D. Manufacturers' Field Services: Contractor shall coordinate services of manufacturers' field services.

#### PART 2 - PRODUCTS

(Not Used)

#### PART 3 - EXECUTION

##### 3.1 OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

- A. Training Preparation Conference: Before operation and maintenance training, Contractor shall convene a training preparation conference to include Owner's operation and maintenance personnel and subcontractors. In addition to requirements specified in Division 1 Section "Demonstration and Training", perform the following:
  - 1. **Section intentionally omitted.**
  - 2. Review installed systems, subsystems, and equipment.
  - 3. Review instructor qualifications.
  - 4. Review instructional methods and procedures.
  - 5. Review training module outlines and contents.
  - 6. Review course materials (including operation and maintenance manuals).
  - 7. Inspect and discuss locations and other facilities required for instruction.
  - 8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
  - 9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.



- B. Training Modules: Develop an instruction program that includes individual training modules for each system, subsystem, and equipment as specified in Division 1 Section "Demonstration and Training".

END OF DOCUMENT

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SECTION 02 41 20

SELECTIVE BUILDING DEMOLITION

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Selectively remove materials, systems, components, fixtures and equipment as designated and as required for completion of Project as indicated.
  - 1. Cap and identify active utilities.
- B. Related Sections:
  - 1. Section 01 50 00: Temporary Facilities and Controls.
  - 2. Section 01 73 29: Cutting and patching.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  - 1. Do not interfere with use of adjacent building spaces not in Project; maintain free and safe passage to and from.
  - 2. Prevent movement of structural components, provide and place bracing and be responsible for safety and support of structural components. Assume liability for movement, settlement, damage or injury.
  - 3. Cease operations and notify Architect immediately if safety of structural components appears to be endangered; take precautions to properly support structures. Do not resume operations until safety is restored.
  - 4. Prevent dust from selective demolition from contaminating adjacent occupied building areas; clean construction dust from adjacent occupied area immediately upon direction of Building Manager.
- B. Design/Build: Provide special engineering to ensure compliance with applicable codes and Contract Documents for support systems.

1.3 SUBMITTALS

- A. Action Submittals: Submit selective demolition operational sequence to ensure Project sequencing is consistent with Owner needs.
- B. Informational Submittals: Submit permits for transport and disposal of debris.

1.4 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control and for construction waste.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Debris: Maintain possession of materials being demolished except where noted as a material for reinstallation or a material to be retained by Owner. Immediately remove debris from site.
  - 1. Immediately remove from site wet materials and materials with water stains, with mold, and with mildew.
- B. Owner Retained Materials: Contact Owner prior to beginning demolition to determine extent of materials to be retained. Carefully remove materials indicated to be retained by Owner; deliver and store where directed.

## **PART 3 - EXECUTION**

### **3.1 EXISTING SERVICES**

- A. Disconnect or remove utility services as required for completion of Project; disconnect, stub off, and cap utility service lines not required for new construction.
  - 1. Do not remove utilities discovered during demolition but not indicated without first determining purpose for utility; coordinate with Architect and Engineers.
- B. Do not disrupt services to adjacent building areas not in Project.
- C. Place markers to indicate location of disconnected services; identify service lines and capping locations on Project Record Documents.

### **3.2 DEMOLITION**

- A. Demolish indicated appurtenances as indicated and as required for Project completion in an orderly and careful manner.
  - 1. Use methods that do not damage materials indicated to remain.
  - 2. Cut concrete and masonry using masonry saws and hand tools; provide sharp clean cuts requiring minimal patching for new construction.
  - 3. Use impact tools only where specifically approved in advance for areas where operations do not disturb building occupancy.
- B. Perform demolition in accordance with authorities having jurisdiction.

- C. Remove demolished materials from site, unless otherwise directed.
  - 1. Remove from site, contaminated, vermin infested, and dangerous materials encountered and dispose of by safe means so as not to endanger health of workers or public.
- D. Remove tools and equipment upon completion of work; leave area in condition acceptable to Owner and Architect.

### **3.3 REPAIR**

- A. Repair damage to adjacent construction caused as result of this work.
- B. Repair demolition beyond that required.

**END OF SECTION**

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**SECTION 05 50 00**

**METAL FABRICATIONS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Provide stock and custom fabricated metal items scheduled at end of this Section, complete in respect to function as intended.
  - 1. Metal fabrications includes items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or metal systems specified elsewhere.

**1.2 REFERENCES**

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

**1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's literature for products used in metal fabrications, including paint, grout and manufactured items.
- B. Shop Drawings: Submit for fabrication and erection of metal fabrications. Indicate profiles, sizes, connection, reinforcing and anchorage.
  - 1. Provide templates for anchorage installation by others.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. System Description: Provide stock and custom fabricated metal items.
- B. Steel Shapes, Plates and Bars: ASTM A36.
- C. Structural Steel Sheet: Hot rolled, ASTM A1011; or cold rolled, ASTM A1008, Class 1; of grade required for design loading.
- D. Steel Tubing: Cold formed ASTM A500; or hot rolled, ASTM A501; minimum Grade B; seamless where exposed.
- E. Castings: Gray iron, ASTM A48, Class 30; malleable iron, ASTM A47.
- F. Fasteners and Rough Hardware: Type required for specific usage; provide zinc-coated fasteners for exterior use or where built into exterior walls.
- G. Welding Materials: AWS D1.1, type required for materials being welded.
- H. Paint: Provide primers as recommended by paint manufacturers for substrates and paints specified in Section 09 90 00 – Painting and Coating.

## **2.2 FABRICATION**

- A. Fabricate items with joints neatly fitted and properly secured.
- B. Grind exposed welds continuous, smooth and flush with adjacent finished surfaces, and ease exposed edges to approximate 1/32" uniform radius.
- C. Exposed Mechanical Fastenings: Flush countersunk fasteners unobtrusively located, consistent with design of structure.
- D. Fit and shop assemble in largest practical sections for delivery.
- E. Make exposed joints flush butt type, hairline joints where mechanically fastened.
- F. Supply components required for proper anchorage of metal fabrications; fabricate anchorage and related components of same material and finish as metal fabrication.
- G. Pre-Engineered Support Systems: Provide manufactured pre-engineered support system consisting of channel supports with anchors, attachments, and accessories as required for complete installation. Sizes to support anticipated loads.
  - 1. Manufacturers:
    - a. Unistrut Inc./Unistrut.
    - b. Grinnell Corp./PowerStrut.
    - c. Thomas & Betts, Inc./Superstrut.
    - d. Substitutions: Refer to Section 01 62 00.
  - 2. Finish: Manufacturer's standard prime paint finish for channel supports; galvanized or similar plated anchors and fasteners; hot dip galvanized where at exterior and exterior exposed applications.
- H. Finishes: Prime paint metal fabrications unless otherwise indicated; comply with requirements of Section 09 90 00 - Painting and Coating for preparation and priming.
  - 1. Thoroughly clean surfaces of rust, scale, grease and foreign matter prior to applying finish.
  - 2. Do not shop prime surfaces in contact with concrete or requiring field welding; shop prime in one coat.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible; do not delay job progress; allow for trimming and fitting where necessary.

### **3.2 ERECTION**

- A. Obtain Architect's review prior to site cutting or making adjustments which are not part of scheduled work.
  - 1. Perform necessary cutting and altering for installation and coordination with other work.
- B. Install items square and level, accurately fitted and free from distortion or defects detrimental to appearance or performance.
  - 1. Supply items required to be cast into or embedded in other materials to appropriate trades.
  - 2. Ensure alignment with adjacent construction; coordinate with related work to ensure no interruption in installation.
- C. Make provision for erection stresses by temporary bracing; keep work in alignment.
- D. Field bolt and weld to match standard of shop bolting and welding; hide bolts and screws whenever possible, where not hidden, use flush countersunk fastenings.
  - 1. Perform field welding in accordance with AWS D1.1.
- E. After installation, touch-up field welds and scratched and damaged surfaces; use primer consistent with shop coat or recommended for galvanized surfaces, as applicable.
- F. Replace items damaged in course of installation and construction.

### **3.3 SCHEDULE**

- A. Supply and install metal fabrications listed in Schedule, complete with anchorage and attachments necessary for installation.
  - 1. Schedule lists principal items only, refer to Drawings for items not listed.
- B. Schedule:
  - 1. Miscellaneous angles, plates and attachments to be set in concrete or masonry for anchorage of other items.
  - 2. Iron and steel shapes, sleeves, anchors, connectors and fastenings required to complete construction work, and which are not provided in other Specification sections.
    - a. Rough hardware, including bolts, fabricated plates, anchors, hangers, dowels and miscellaneous metals.
  - 3. Pre-engineered support systems.

**END OF SECTION**

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**SECTION 06 10 50**

**MISCELLANEOUS ROUGH CARPENTRY**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Provide miscellaneous wood blocking and plywood, including blocking for roofing system and related flashing.

- 1. Preservative treat wood members as indicated.

**1.2 REFERENCES**

- A. Forest Products Society (FPS): National Design Specification for Stress Grade Lumber and its Fastening.

**1.3 SUBMITTALS**

- A. Product Data: Submit wood treatment certifications and instructions for proper use of each type of treated material.

**1.4 QUALITY ASSURANCE**

- A. Lumber Grades: Provide visible grade stamp of an agency certified by FPS.
- B. Lumber Standard: Comply with US Product Standard PS20 for each indicated use, including moisture content and actual sizes related to indicated nominal sizes.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. System Requirements: Provide miscellaneous wood blocking including blocking for roofing repairs and related flashing.
- B. Regulatory Requirements: Comply with applicable code requirements for miscellaneous rough carpentry.
- C. Blocking: Provide dimensional lumber graded in accordance with FPS Grading Rules; Construction Grade, Douglas Fir; minimum S-Dry.
- D. Nails, Spikes and Staples: Galvanized; size and type to suit application.
- E. Bolts, Nuts, Washers, Lags, Pins and Screws: Medium carbon steel; galvanized; size and type to suit application.
- F. Fasteners: Provide fasteners as required for complete, secure installation of miscellaneous rough carpentry.



## **2.2 FABRICATION**

- A. Wood Preservation: Treat wood to comply with applicable requirements of American Wood Preservers Association and applicable codes.
  - 1. Decay Resistance Treatment: Pressure treat wood in accordance with AWPA U1 using preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium.
    - a. Treat wood members based on AWPA U1 Use Categories as appropriate to Project location and exposure.
    - b. Kiln-dry wood to a maximum moisture content of 19% after treatment with water-borne preservative.
  - 2. Complete fabrication of treated items prior to treatment, wherever possible; if cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.
  - 3. Inspect each piece after drying and discard damaged and defective pieces.

## **PART 3 - EXECUTION**

### **3.1 PLACEMENT**

- A. Place miscellaneous rough carpentry true to lines and levels.
- B. Correlate location so attached work will comply with design requirements and be properly located.
- C. Construct members of continuous pieces of longest possible lengths.
- D. Fit carpentry work to other work; scribe and cope as required for accurate fit.
- E. Shim with metal or slate for bearing on concrete and masonry.
- F. Securely attach carpentry work to substrates by anchoring and fastening as required by recognized standards.
  - 1. Provide washers under bolt heads and nuts in contact with wood.
- G. Wood Blocking: Provide blocking of S4S lumber not less than 1-1/2" wide and of thickness required to provide adequate support or to properly locate attached material.
  - 1. Provide attachment to other work; form to shapes shown.
  - 2. Countersink bolts and nuts flush with surfaces.
  - 3. Remove temporary blocking when no longer needed.

**END OF SECTION**

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SECTION 07 01 50

ROOFING REPAIRS

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Patch and repair existing single ply roofing system including insulation and accessories as required for new construction as required for complete weathertight roof.
- B. Related Work:
  - 1. Section 07 60 00: Metal flashings.

1.2 REFERENCES

- A. National Roofing Contractors Association: The NRCA Roofing and Waterproofing Manual.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Existing Roof Analysis:
  - 1. Owner Information: Obtain information from Owner regarding type of single ply member, manufacturer, supplier, and original installer along with any warranty requirements that may still apply.
    - a. Where information is available use original manufacturer materials and original supplier and installer to extent still in business.
  - 2. No Owner Information: Where information is not available from Owner, provide services of roofing consultant to analyze existing roofing system and to provide recommendations for appropriate materials for patching and repair.
    - a. Report: Roofing consultant to prepare report indicating observations and recommendations. Report to note where testing may be necessary for verification of existing materials.
- B. Pre-Installation Meeting: Convene not less than one week prior to commencing work of this section. Require attendance of parties directly affecting work of this section.
  - 1. Review installation procedures and coordination required with related work.

1.4 SUBMITTALS

- A. Product Data: Provide literature for roofing system and each type of material; list each material proposed on Project.
  - 1. Provide report analyzing existing roofing system.

- B. Manufacturer Certificates: Certification materials and components furnished conform to Specification requirements and are compatible with each other, existing roof, roof substrate, and related work.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Roofing manufacturer certified or approved.
- B. Supervisor: Installer to maintain full-time supervisor/foreman who is on jobsite during roofing work who is experienced in installation of roofing system specified.

#### **1.6 PROJECT CONDITIONS**

- A. Do not apply roofing membrane during inclement weather or when air temperature may fall below 40 degrees F, taking into consideration added wind chill factor.
  - 1. Do not allow materials to be exposed to moisture during transportation, storage, handling or installation.
- B. Do not apply roofing membrane to damp, frozen, and unsuitable deck surface.
  - 1. Allow sufficient time for moisture from previous precipitation, fog or dew to evaporate before proceeding with roofing work.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

#### **1.7 WARRANTY**

- A. Extended Correction Period: Provide for correcting failure of system to resist damage from anticipated sources including damage from wind and water penetration. Repair system and pay for or replace damaged materials and surfaces.
  - 1. Period: Two years.

### **PART 2 - PRODUCTS**

#### **2.1 SYSTEMS MANUFACTURERS**

- A. Original roofing system manufacturer.
- B. Substitutions: Refer to Section 01 62 00.
  - 1. Manufacturers listed under specific products are acceptable in addition to primary roofing material manufacturers.

## **2.2 MATERIALS**

- A. System Description: Provide new materials are required to patch and repair existing roofing system, including insulation, as required for new construction, with base flashings and accessories.
- B. Regulatory Requirements: Provide materials capable of achieving following.
  - 1. Fire and Wind Resistance: Conform to California Building Standards Code requirements for Underwriters Laboratory (UL) Class A roof system, with UL Class 60 wind resistance classification.
- C. New Roofing Materials: Provide new materials matching existing material types and conforming to requirements of NRCA Roofing Manual applicable to existing system.
  - 1. Surfacing: Match existing using materials recommended by roofing system manufacturer and NRCA.
- D. Insulation: Match existing insulation systems to extent available; do not apply built-up roofing over plastic type insulation, where plastics used originally, cover with perlite fiber or glass fiber insulation.
- E. Accessories: Provide as recommended by materials manufacturers and complying with recommendations of NRCA and specified Quality Assurance requirements for fire rating and wind blowoff resistance.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Remove existing roofing as required for Project; remove only as much roofing as can be replaced in same day unless otherwise approved in advance by Architect.
  - 1. Take care not to remove materials beyond those required for new construction.
  - 2. Inform Architect and Owner where existing materials beyond those required to be removed are damaged or may be unsuitable due to moisture or deterioration.
- B. Inspect substrates and roof deck to ensure substrates and deck are clean and smooth, free of depressions, waves or projections, and are properly sloped to drains, valley, or eaves.
- C. Ensure roof openings and curbs, and pipes, sleeves, ducts or vents through roof are solidly set, reglets in place, and nailing strips located where required.
- D. Inspect roofing materials to ensure they are dry at time of installation.
- E. Apply roofing over clean, dry and warm surfaces during fair weather.

### **3.2 PREPARATION**

- A. Protect surrounding surfaces against damage from roofing work.
- B. Where hoisting is necessary, hang tarpaulins to protect walls.

### **3.3 INSTALLATION**

- A. Insulation Application (Where Applicable): Attach insulation in accordance with insulation manufacturer's instructions and NRCA recommendations for installation of insulation on deck involved.
  - 1. Lay insulation boards to moderate contact without forcing joints.
  - 2. Cut insulation to fit neatly to perimeter blocking and around projections through roof.
  - 3. Install tapered crickets, cants and edge strips in accordance with manufacturer's instructions and NRCA recommendations.
  - 4. Leave no insulation exposed at end of day's work; apply glaze coat of hot bitumen and two plies of felt over insulation and install cut-off weathertight.
- B. Roof Membrane Application: Apply roofing membrane in accordance with manufacturer's instructions and NRCA recommendations for roof type.
  - 1. Apply roofing smooth, free from air pockets, wrinkles, fishmouths, prominent lap joints or tears.
  - 2. Carry roof up vertical surfaces and secure to nailing strips and reglets.
  - 3. Comply with manufacturer's recommendations for installation of base and field flashings.
  - 4. Coordinate metal flashings and counterflashing.
  - 5. Coordinate installation of roof drains and related flashings.
  - 6. Mop in and seal flashings and flanges of items projecting through membrane.

### **3.4 CLEANING**

- A. In areas where finished surfaces are soiled by roofing work, consult manufacturer of finished surfaces for recommended cleaning methods.
- B. Leave completed roof free from debris and uniform in appearance.

### **3.5 PROTECTION**

- A. Where work must continue over finished roofing membrane, protect surface in accordance with manufacturer recommendations.

**END OF SECTION**

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SECTION 07 60 00

FLASHING AND SHEET METAL

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide galvanized steel flashing and sheet metal including accessories as required for complete weathertight installation.
  - 1. Provide concealed sealants used in conjunction with installation of metal flashing and sheet metal.
- B. Related Sections:
  - 1. Section 06 10 50: Miscellaneous rough carpentry.

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.

1.3 SUBMITTALS

- A. Product Data: Furnish literature for manufactured products.
- B. Shop Drawings: Clearly indicate dimensioning, layout, general construction details including closures, flashings, locations and types of sealants, anchorages, and method of anchorage.

1.4 WARRANTY

- A. Extended Correction Period: Provide for correcting failure of system to resist damage from anticipated sources including damage from wind and water penetration. Repair system and pay for or replace damaged materials and surfaces.
  - 1. Period: Two years.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. System Description: Provide galvanized steel flashing and sheet metal including accessories as required for complete weathertight installation.
- B. Design Criteria: Allow for movement of components without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to 100 year seasonal temperature ranges.

- C. Flashing and Sheet Metal: ASTM A924 and A653 G90 galvanized steel; minimum 24 gage.
  - 1. Accessories: Provide as required for a complete system and complying with SMACNA Manual.
  - 2. Provide heavier gage metal where recommended by SMACNA Manual for size of component.
  - 3. Mill phosphatized where indicated to be field painted.
- D. Solder and Fasteners: As recommended by SMACNA and complying with applicable codes and regulations; hot dipped galvanized minimum coating comparable to G90.
- E. Concealed Sealant: Butyl type for use in conjunction with sheet metal; non-staining; non-corrosive; non-shrinking and non-sagging; ultra-violet and ozone resistant for exterior concealed applications.
- F. Sealing Compound: Type recommended by roofing manufacturer; asbestos free.

## **2.2 FABRICATION**

- A. Fabricate sheet metal in accordance with SMACNA Architectural Sheet Metal Manual.
- B. Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
  - 1. Fabricate corners and intersections in shop with solder joints; watertight fabrication.
- C. Form sections in maximum 10'-0" lengths; make allowance for expansion at joints.
- D. Hem exposed edges on underside 1/2".
- E. Backpaint flashings with heavy bodied bituminous paint where in contact with cementitious materials or dissimilar metals.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install metal flashing and sheet metal in accordance with SMACNA Architectural Sheet Metal Manual.
  - 1. Install tight in place, with corners square, surfaces true and straight in planes, and lines accurate to profiles as indicated on Drawings.
  - 2. Lap joints in direction of water flow.
- B. Exercise care when cutting materials on site, to ensure cuttings do not remain on finished surfaces.

- C. Provide expansion joints concealed within system.
- D. Use concealed fasteners, continuous cleat type, except where specifically approved by Architect.
  - 1. Exposed fasteners may be used, where clearly indicated on shop drawings and approved by Architect, at areas not exposed at exterior walls nor in sight of interior spaces.
- E. Apply sealing compound at junction of metal flashing and felt flashing.
- F. Lock seams and end joints; fit flashing tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- G. Counter-flash mechanical and electrical items projecting through roof membrane.
- H. Install sealants where required to prevent direct weather penetration.
- I. Completed installation shall be free of rattles, noise due to thermal and air movement, and wind whistles.

**END OF SECTION**



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SECTION 07 90 00

JOINT SEALANTS

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide joint sealants, for interior joints not specified elsewhere, with backing rods and accessories as required for complete installation.
  - 1. Joint sealants include joint sealers and calking as indicated.
- B. Related Sections:
  - 1. Section 07 60 00: Flashing and sheet metal concealed sealants.
  - 2. Section 08 80 00: Glazing sealants.
  - 3. Section 09 21 00: Sealants used for acoustical treatment at gypsum board.

1.2 SUBMITTALS

- A. Product Data: Furnish manufacturer's descriptive literature.
- B. Samples: Furnish samples of each type of exposed joint sealer in required colors.
- C. Certifications:
  - 1. Furnish manufacturer's certification joint sealers comply with Contract Documents and are suitable for Project applications.

1.3 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives, sealants, and caulks.
  - 1. Provide joint sealants as required by applicable codes and regulations to fill joints and openings in building envelope separating conditioned space from unconditioned space.
- B. Installer Qualifications: Firm with minimum five years successful experience on projects of similar type and size, using specified products.
  - 1. Installers shall be familiar with proper application procedures to ensure maximum joint sealer expansion and contraction capabilities.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, cure time, and mixing instructions.

**1.5 SITE CONDITIONS**

- A. Do not proceed with installation of joint sealers under unfavorable weather conditions.
- B. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer.

**1.6 WARRANTY**

- A. Extended Correction Period: Extend correction period to two years.
  - 1. Repair or replace joint sealers which fail to perform as intended, because of leaking, crumbling, hardening, shrinkage, bleeding, sagging, staining, loss of adhesion, and loss of cohesion.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. System Description: Provide joint sealants with backing rods and accessories.
- B. Performance Requirements:
  - 1. Select materials for compatibility with joint surfaces and indicated exposures.
  - 2. Where not indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
  - 3. Comply with applicable limitations on volatile organic compound (VOC) emissions.
- C. Regulatory Requirements: Comply with applicable regulatory requirements regarding limitations on volatile organic compound (VOC) emissions limitations.
- D. Non-Elastomeric Sealants:
  - 1. Acrylic-Emulsion Sealant: ASTM C834 acrylic or latex-rubber-modified acrylic sealant, permanently flexible, non-staining and non-bleeding; recommended for general interior exposure; compatible with paints specified in Section 09 90 00.
    - a. Provide at general interior applications.
    - b. Manufacturers:
      - 1) Pecora Corp./AC-20.
      - 2) Tremco/Tremflex 834.
      - 3) Substitutions: Refer to Section 01 62 00.

2. Air Seals: Provide non-staining and non-bleeding sealers, calks, or foams appropriate to specific applications for filling openings between conditioned and unconditioned spaces.
  - a. Type: As recommended by manufacturer for each specific application; compatible with adjacent materials.
  - b. Manufacturers:
    - 1) Dow/Great Stuff.
    - 2) Owens Corning/EnergyComplete Air Sealant.
    - 3) Substitutions: Refer to Section 01 62 00.
- E. Miscellaneous Materials:
  1. Primers/Sealers: Non-staining types recommended by joint sealer manufacturer for joint surfaces to be primed or sealed.
  2. Joint Cleaners: Non-corrosive types recommended by joint sealer manufacturer; compatible with joint forming materials.
  3. Bond Breaker Tape: Polyethylene tape as recommended by joint sealer manufacturer where bond to substrate or joint filler must be avoided for proper performance of joint sealer.
  4. Sealant Backer Rod: Compressible polyethylene foam rod or other flexible, permanent, durable non-absorptive material as recommended by joint sealer manufacturer for compatibility with joint sealer.
    - a. Oversize backer rod minimum 30% to 50% of joint opening.
- F. Colors: Provide colors indicated or as selected by Architect from manufacturer's full range of colors.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Prepare joint surfaces in accordance with ASTM C1193 and as recommended by joint sealer manufacturer.
- B. Clean joint surfaces immediately before installation of joint sealer; remove dirt, insecure materials, moisture and other substances which could interfere with bond of joint sealer.
- C. Prime or seal joint surfaces where recommended by joint sealer manufacturer; do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- D. Ensure protective coatings on surfaces in contact with joint sealers have been completely stripped.

### **3.2 INSTALLATION**

- A. Comply with manufacturer's printed instructions and ASTM C1193, except where more stringent requirements are shown or specified.
- B. Set sealant backer rods at proper depth or position in joint to coordinate with other work, including installation of bond breakers and sealant; do not leave voids or gaps between ends of backer rods.
  - 1. Do not stretch, twist, puncture or tear backer rods.
- C. Install bond breaker tape as required to avoid three-sided bond of sealant to substrate and where required by manufacturer's recommendations to ensure joint sealers will perform properly.
- D. Size materials to achieve required width/depth ratios.
- E. Employ installation techniques that will ensure joint sealers are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of bond surfaces equally on opposite sides.
- F. Joint Configuration: Fill sealant joint to a slightly concave surface, slightly below adjoining surfaces, unless otherwise indicated.
- G. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture or dirt.
- H. Install joint sealers to depths recommended by joint sealer manufacturer but within the following general limitations, measured at center (thin) section of bead.
  - 1. Non-Elastomeric Joints: 75% to 125% of joint width.
- I. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.
  - 1. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- J. Cure joint sealers in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
- K. Maintain finished joints free of embedded matter, ridges and sags.

**END OF SECTION**

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SECTION 08 11 20

INTERIOR ALUMINUM FRAMES

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide aluminum frames for interior doors and glazed partitions, with attachments and accessories as required for complete installation. Match existing interior aluminum frames to extent possible.

1. Prepare frames for door hardware.

- B. Related Work:

1. Section 08 71 00: Door hardware.  
2. Section 08 80 00: Glazing.

1.2 REFERENCES

- A. National Association of Architectural Metal Manuf. (NAAMM): Metal Finishes Manual.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate hardware installation with Section 08 71 00 - Door Hardware.  
2. Coordinate glass installation with Section 08 80 00 - Glazing.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's literature.
- B. Shop Drawings: Indicate pertinent dimensioning, general construction, component connections and locations, anchor methods and locations.
- C. Samples: Submit samples of aluminum finish.
1. Submit frame corner construction.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEMS MANUFACTURERS**

- A. Wilson Partitions.
- B. Western Integrated Materials, Inc.
- C. RACO Interior Products.
- D. Substitutions: Refer to Section 01 62 00.

### **2.2 MATERIALS**

- A. System Description: Provide aluminum frames for interior doors and glazed partitions, with attachments and accessories.
- B. Interior Aluminum Frames: Knock-down (field assembled) door frames; extruded aluminum, ASTM B221, 6063-T5 alloy; profile as indicated.
  - 1. Frame Profiles: Match existing.
  - 2. Glazed Partition Frames: Provide extruded aluminum security type snap-in glass stops.
  - 3. Door Stop Gasketing: Provide continuous elastomeric vinyl gasketing at door stop.
- C. Finish: Match existing interior aluminum frames.

### **2.3 FABRICATION**

- A. Fabricate aluminum frames to allow for clearances and shim spacing around perimeter; provide for thermal movement.
- B. Provide anchorage devices to securely and rigidly fit frames in place.
  - 1. Conceal anchorage devices and fasteners.
- C. Accurately fit together joints and corners; match components ensuring continuity of line and design; ensure joints and connections are flush, hairline and weatherproof.
- D. Provide required internal reinforcing for door hardware.
  - 1. Refer to Section 08 71 00 for hardware requirements.
- E. Apply coat of bituminous paint on concealed aluminum surfaces to be in contact with cementitious or dissimilar materials.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Install aluminum frames in accordance with recommendations of manufacturer.
- B. Ensure assemblies are plumb, level and free of warp or twist; maintain dimensional tolerances and alignment with adjacent work.
- C. Use sufficient anchorage devices to securely and rigidly fasten frame assemblies to building.
- D. After installation, touch-up scratched and damaged surfaces; remove and replace damaged frames where touch-up is noticeable from 5'-0" or more.

**END OF SECTION**

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**SECTION 08 14 00**

**WOOD DOORS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes: Provide flush wood doors as indicated. Match existing.

1. Contractor Option: Provide shop finished wood doors.

B. Related Work

1. Section 08 11 20: Interior aluminum frames.
2. Section 08 71 00: Door hardware.

**1.2 REFERENCES**

- A. Architectural Woodwork Standards, Edition 2, 2014, (AWS) adopted and published jointly by AWI, AWMAC, and Woodwork Institute.
- B. Window and Door Manufacturer's Association (WDMA): Guide Specifications.

**1.3 ADMINISTRATIVE REQUIREMENTS**

A. Coordination:

1. Hardware: Coordinate hardware installation with Section 08 71 00 – Door Hardware.
2. Painting: Coordinate with Section 09 90 00 – Painting and Coating whether wood doors are to be shop finished or field painted.

**1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's literature.
- B. Shop Drawings: Indicate general construction, jointing methods, hardware locations, and locations of cut-outs.
- C. Samples: Submit samples of wood doors indicating construction, veneering, and finish.
  1. Submit shop finish for wood doors where doors are furnished shop finished.
- D. Certificates: Submit manufacturer certification indicating compliance to applicable requirements of either AWS or WDMA Standards; note which standards were followed or if both standards have been met.



**1.5 QUALITY ASSURANCE**

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for composite wood products formaldehyde limitations and paints and coatings.

**1.6 PROJECT CONDITIONS**

- A. Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized in accordance with referenced standards requirements applicable to Project location.

**1.7 WARRANTY**

- A. Extended Correction Period: Provide for replacing, rehanging, and refinishing wood doors exhibiting defects in materials or workmanship including warp and delamination.

- 1. Period: Two years.

**PART 2 - PRODUCTS**

**2.1 SYSTEMS MANUFACTURERS**

- A. Algoma Hardwoods, Inc.
- B. Eggers Industries Architectural Door Division.
- C. Marshfield Door Systems, Inc.
- D. VT Industries.
- E. Substitutions: Refer to Section 01 62 00.

**2.2 MATERIALS**

- A. System Description: Provide flush wood doors as indicated.
- B. Solid Core Flush Wood Doors: AWS/Premium Grade, 5 Ply Hot Press, 1-3/4" thick solid wood framed glued block construction or particleboard core five ply construction; Contractor option to use WDMA comparable standards.
  - 1. Transparent/Stained Wood Veneers: AWS/Premium Grade veneers for transparent/stained finish; nominal 1/40" thick before sanding, not less than 1/50" after sanding.
    - a. Wood Veneers: Match existing as approved by Architect.
  - 2. Edges: Stile edges to match face veneer, minimum 1-1/8" thick after trim.
  - 3. Core: Bond stiles and rails to core and sand prior to assembly of face veneers.
  - 4. Bond Type: Provide Type II Bond for interior doors.

## **2.3 FABRICATION**

- A. Fabricate doors in accordance with requirements of specified standards.
  - 1. Prefit wood doors.
  - 2. Prepare doors to receive hardware in shop, refer to Section 08 71 00 for hardware requirements and templates.
  - 3. Factory machine doors for mortise hardware.
- B. Bevel strike edge of single-acting doors, 1/8" in 2".
- C. Shop Finished Doors (Contractor Option): Conform to requirements specified in Section 09 90 00 – Painting and Coating.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install wood doors in accordance with manufacturer's recommendations and installation instructions, and reference standards, plumb and square, and with maximum diagonal distortion of 1/16".
- B. Rehang or replace doors which do not swing or operate freely.

### **3.2 PROTECTION**

- A. Protection: Protect doors as recommended by door manufacturer to ensure doors are without damage at time of substantial completion.
  - 1. Shop Finished Doors: Refinish or replace damaged doors.

**END OF SECTION**

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**SECTION 08 31 00**

**ACCESS DOORS AND PANELS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Provide access doors set in finished surfaces.
  - 1. Provide access doors and panels as required for access to controls and valves behind finished surfaces.
  - 2. Coordinate with various trades for controls and valves which may be concealed.

**1.2 SUBMITTALS**

- A. Product Data: Furnish manufacturer's literature.
- B. Shop Drawings: Indicate locations of access doors required but not indicated on Architectural Drawings.

**PART 2 - PRODUCTS**

**2.1 SYSTEMS MANUFACTURERS**

- A. Nystrom Building Products.
- B. J.L. Industries.
- C. Karp Associates, Inc.
- D. Substitutions: Refer to Section 01 62 00.

**2.2 MATERIALS**

- A. System Description: Provide access doors and panels set in finished surfaces.
- B. Access Doors and Panels: Provide access door and panel assemblies consisting of an integral unit with flush metal doors and panels, complete and ready for installation.
  - 1. Type: Flush panel access doors; provide type with frame flange concealed in finished construction.
- C. Frames: Fabricate from not less than 16 gage steel.
- D. Doors: Flush panel type, fabricate from not less than 14 gage steel.
- E. Hinges: Provide continuous piano type hinge.

- F. Locking Devices: Provide flush, key-operated cylinder lock for each access door; provide two keys per lock and key locks alike, unless otherwise scheduled.
- G. Finish: Finish with manufacturer's factory-applied enamel prime coat applied over phosphate coating on steel.

## **2.3 FABRICATION**

- A. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units which may vary slightly from sizes shown or scheduled.
- B. Fabricate units of continuous welded steel construction; grind welds smooth and flush with adjacent surfaces.
- C. Provide attachment devices and fasteners of type required for specific job conditions.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas and conditions under which access doors are to be installed.
  - 1. Do not proceed with work until unsatisfactory conditions are corrected; installation signifies acceptance of conditions.
- B. Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment; coordinate installation with work of other trades.

### **3.2 INSTALLATION**

- A. Comply with manufacturer's installation instructions for access doors.
- B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- C. Adjust hardware and doors after installation for proper operation.

### **3.3 PROTECTION**

- A. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

**END OF SECTION**

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**SECTION 08 71 00**

**DOOR HARDWARE**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes: Provide hardware for hollow metal and wood doors.

1. Provide cylinders for doors fabricated with hardware.

B. Related Sections:

1. Section 08 11 20: Door gaskets at interior aluminum frames.
2. Review other sections for doors fabricated with hardware.

**1.2 REFERENCES**

- A. ANSI A115 and A115W Series: Door and Frame Preparation Standards.
- B. ANSI A156 Series: Standards for various hardware items.
- C. California Building Code: California Code of Regulations, Title 24, Part 2.
- D. Americans with Disabilities Act (ADA) Standards.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate hardware installation doors including but not necessarily limited to following.
  1. Coordinate hardware installation with interior aluminum frames in Section 08 11 20.
  2. Coordinate hardware with installation with wood doors installation in Section 08 14 00.
- B. Pre-Installation Meeting: Convene pre-installation meeting prior to commencing work of this section. Include persons involved with installation of doors, frames, and hardware.

**1.4 SUBMITTALS**

- A. Product Data: Submit catalog cuts for each type of hardware clearly marked to indicate hardware type to be provided, style, finish, and options.
  1. Supply templates to door and frame manufacturers for proper and accurate sizing and locations of cut-outs for hardware.
- B. Shop Drawings: Indicate locations and mounting heights of hardware.

- C. Samples: Indicate required style and finish of exposed door hardware.
- D. Keying Schedule: Coordinate directly with Owner's Representative. All keying should be discussed prior to installation. Any other door hardware related questions shall be referred to County Locksmith for information.
- E. AHC Certification: Submit certification by AHC indicating hardware complies with applicable codes and Contract Documents.
- F. Closeout Submittal: Record actual locations of installed cylinders and master key codes on Project Record Documents.
- G. Maintenance Materials: Submit manufacturer's parts list and maintenance instructions for each type of hardware supplied and necessary wrenches and tools required for proper maintenance of hardware.

## **1.5 QUALITY ASSURANCE**

- A. Supplier Qualifications: Recognized builder's hardware supplier with minimum five years successful experience in scheduling and furnishing hardware.
  - 1. Provide services of architectural hardware consultant to supervise hardware supply.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver hardware in manufacturer's original packages, marked for intended opening and use.
- B. Pack complete with necessary screws, bolts, keys, instructions, and installation template, if necessary, for spotting mortising tools.
- C. Upon delivery, furnish complete list of hardware for checking, clearly marked to correspond with marking on each package.
  - 1. Review list for completeness and accuracy.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. System Description: Provide door hardware and accessories as required for complete operational installation.
  - 1. Review Drawings for door locations and types; comply with following general requirements; inform Architect where conflicts occur.
  - 2. Provide hardware items with accessories complete to door function as intended, as specified, and as required by applicable codes and regulations.
  - 3. Provide heavy duty commercial grade units of each type of hardware (hinges, pivots, locksets, latchsets, closers, trim) from single manufacturer unless

otherwise indicated. All other hardware coordinators, flush bolts, handicap buttons, etc should be Grade 1

**B. Regulatory Requirements:**

1. Access for Persons with Disabilities: Comply with California Building Code and Americans with Disabilities Act (ADA) Standards.

**C. Design Requirements:**

1. Finishes: Provide finishes to match: other hardware on same door; hardware on other doors in same area; and as required to match other metal finishes in same room such a white metal finishes in bathrooms with chrome fixtures.
2. Security: Coordinate security requirements such as locking, electrically controlled hardware, and electric monitoring devices directly with Owner and Owner's security consultant.
3. Complete Sets: Provide complete sets of hardware for each door considering requirements for both sides of doors and including coordinating devices and accessories as would normally be anticipated for specific door applications.

**D. Hinges and Butts: ANSI A156.1; comply with following unless otherwise indicated.**

**1. Manufacturers:**

- a. Hager Co.
- b. Lawrence Hardware Inc.
- c. McKinney Products Co., Div of ASSA ABLOY.
- d. Stanley Hardware.
- e. Substitutions: Refer to Section 01 62 00.

2. Doors 1-3/4" Thick: 4-1/2" heavy weight, extra heavy weight ball or oilite bearing where over 40" wide.

- a. Provide widths sufficient to clear trim projection when door swings 180 degrees.

3. Provide minimum three hinges to 90" high, four hinges to 120" high for each door leaf, unless otherwise indicated.
4. Provide nonferrous butts with non-removable pins at exterior and locked outswinging doors, non-rising at interior doors; stainless steel where labeled; steel butts at labeled interior doors.
5. Provide ball bearing or oilite bearing hinges at doors with closers.
6. Tips: Flat button tips with matching plug unless otherwise indicated.

- E. Locking Devices: Provide of metal matching specified finish; interior parts of steel and zinc-dichromate plating, to resist rusting and corrosion; do not supply plastic, die-cast or aluminum mechanisms.
  - 1. Manufacturers:
    - a. Schlage Lock Co. Div. Allegion.
    - b. Sargent Manufacturing Co., Division of ASSA ABLOY Group.
    - c. Yale Security, Inc. Division of ASSA ABLOY Group.
    - d. Best Access Systems a Stanley Company.
    - e. Substitutions: Refer to Section 01 62 00.
  - 2. Type: Provide locksets with not less than 6 pin tumbler cylinders unless higher level of security is required by Owner.
    - a. Mortise Locksets and Latchsets: ANSI A156.13, Series 1000, Grade 1, Mortise Type.
      - 1) Provide where indicated.
    - b. Cylindrical Locksets and Latchsets: ANSI A156.2, Series 4000, Grade 1, Bored Type (cylindrical).
      - 1) Provide where indicated.
  - 3. Lockset and Latchset Design: Solid Schlage ND lever with rose. Lever design and color to match building design. To be as selected by Architect.
  - 4. Backset: 2-3/4".
  - 5. Strikes: Furnish standard strikes with extended lips where required to protect trim from being marred by latch bolt; verify type of cutouts provided in metal frames.
- F. Cylinders, Keys, and Keying: Hardware manufacturers shall provide for grand master, master key alike or key different keying as directed by Owner.
  - 1. Manufacturer: Provide cylinders by lockset manufacturer unless otherwise indicated.
  - 2. Interchangeable Cores: Provide cylinders with interchangeable cores unless otherwise indicated.
  - 3. Provide cylinders of extruded brass bar material.
  - 4. Provide construction cylinders for doors requiring locking during construction; construction cylinders shall be removed and replaced just prior to Owner occupancy.
  - 5. Submit keys for final use to Owner; provide not less than two keys for each lockset, six of each type and level of masterkey, two grand master keys, and 5% extra blanks.



- G. Closers: ANSI A156.4, furnish products of one manufacturer; full rack and pinion type with steel spring and non-freezing hydraulic fluid.
1. Manufacturers:
    - a. LCN Closers Division Allegion/4000 Series.
    - b. Norton Division, ASSA ABLOY/7500 Series.
    - c. Dorma Door Controls/8900 Series Full Cover.
    - d. Substitutions: Refer to Section 01 62 00.
  2. Provide controls for regulating closing, latching, speeds and back check.
  3. Arm types shall suit individual conditions, as approved; supply parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
  4. Mount closers on room side or pull side unless otherwise indicated.
  5. Sizes: Adjustable to following maximum door operating pressures:
    - a. Typical Doors: 5 pounds.
    - b. Closers shall be adjusted by factory representative.
  6. Design: ANSI Modern Type with Cover, unless otherwise indicated.
- H. Thresholds, Stops, Trim, and Miscellaneous Hardware: Provide as indicated, as specified, as included in Hardware Schedule, and as required for complete installation.
1. Manufacturers:
    - a. Builders Brass Works Corp.
    - b. Glynn-Johnson Co. Div. Allegion.
    - c. Ives Div. Allegion.
    - d. National Guard Products.
    - e. Pemko Mfg. Co. Div. ASSA ABLOY.
    - f. Zero International, Inc., Div. Allegion.
    - g. Substitutions: Refer to Section 01 62 00.
  2. Door Stops: Required at all doors; locate as indicated, as required to minimize trip hazard and obstruction as approved and where not otherwise indicated.

## **2.2 ACCESSORIES**

- A. General: Provide complete hardware with accessories as required for doors and applications indicated.
- B. Templates: Furnish templates or physical hardware items to manufacturers concerned sufficiently in advance to avoid delay in Work.
- C. Reinforcing Units: Furnished by door manufacturer, coordinated by hardware manufacturer.

- D. Fasteners: Furnish as recommended by manufacturer and as required to install secure hardware.
  - 1. Finish: Match hardware.
  - 2. Furnish screws for items applied on gypsum board sufficiently long to provide solid connection to framing or backing
- E. Through Bolts: Through bolts and grommet nuts shall be avoided on door faces in highly visible areas, unless no alternative is possible, as directed and approved, and shall not be used for solid wood core doors.
- F. Electrical and Mechanical: Make provisions and coordinate requirements for mechanical and electrical devices in connection with hardware.

## **2.3 FINISHES**

- A. General: Match existing finishes unless otherwise indicated on Door and Hardware Schedules.
- B. Other Items: Provide manufacturer's standard finishes matching similar hardware types on same door, and maintain acceptable finish considering anticipated use.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install finish hardware specified under this section; coordinate with manufacturer and installation of doors and frames.
- B. Fit hardware prior to painting. Remove for painting of doors and frames before final installation of hardware.
- C. Install hardware in accordance with manufacturer's instructions.
- D. No extra cost will be allowed because of changes or corrections necessary to facilitate installation of hardware.

### **3.2 MOUNTING POSITIONS**

- A. General: Heights given are center line heights from finished floor; comply with following unless otherwise required by applicable codes or regulations.
  - 1. Locks and Latches: 38" to center of lever.
  - 2. Door Pulls: 42" to center of grip.
  - 3. Push Plate: 42"; coordinate with pull location.
  - 4. Push-Pull Bar: 42" to center of bar.

5. Top Hinge: To jamb manufacturer's standard, but not greater than 10" from head of frame to center line of hinge.
  6. Bottom Hinge: To jamb manufacturer's standard, but not greater than 12-1/2" from floor to center line of hinge.
  7. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.
  8. Hinge Mortise on Door Leaf: 1/4" to 5/16" from stop side of door.
  9. Dead Bolt: Not more than 44" from floor to operating lever.
- B. Standards: Comply with recommendations of Builders Hardware Manufacturers Association, subject to approval, for heights of items not indicated.

### **3.3 ADJUSTING**

- A. Qualified hardware supplier's or manufacturer's representatives shall inspect installation and make adjustments.
1. Adjust closers, locks, and critical operational hardware.
  2. Deliver instructions for maintenance and future adjustments to Owner's Representative.

### **3.4 HARDWARE SCHEDULE**

- A. The Hardware Schedule establishes a type and standard of quality.
- B. Examine Drawings and Specifications and furnish proper hardware for door openings, whether listed or not.
- C. Bring omissions to attention of Architect prior to bid opening for instructions; otherwise, list will be considered complete; no extras will be allowed.
- D. Hardware Groups: Refer to Drawings.

**END OF SECTION**

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**SECTION 08 80 00**

**GLAZING**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

**A. Section Includes:**

1. Provide miscellaneous glass and glazing not provided elsewhere including accessories as required for complete installation.
  - a. Provide glazing for interior aluminum frames.

**B. Related Sections:**

1. Section 08 11 20: Interior aluminum frames.

**1.2 REFERENCES**

- A. Glass Association of North America (GANA): Glazing Manual and Sealant Manual.**

**1.3 SUBMITTALS**

- A. Product Data:** Furnish for each type of glass and exposed glazing material.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. System Description:** Section includes miscellaneous glass and glazing materials for items typically furnished without glazing and where glazing is not an integral part of the assembly.
- B. Regulatory Requirements:**
1. Safety Glass Standard: Comply with applicable codes, CPSC 16 CFR 1201, and pass ANSI Z97.1.
- C. Tempered Glass:** Select glazing quality, clear float glass, fully tempered, ASTM C1048, Kind FT; nominal thickness 1/4"; safety glass.
1. Manufacturers:
    - a. PPG Industries, Inc.
    - b. Oldcastle Building Envelope.
    - c. Guardian Industries Corp.
    - d. Substitutions: Refer to Section 01 62 00.

- D. Spacer Shims: Silicone compatible, 50 durometer hardness; 3" long by 3/32" thick by 1/4" high.
- E. Setting Blocks: 70-90 durometer hardness; 4" long by 3/8" thick by 1/4" high standard setting blocks.
- F. Glazing Sealant: ASTM C920, Type S, Grade NS, elastomeric one-component silicone glazing sealants as recommended by sealant manufacturer for application involved.
  - 1. Manufacturers:
    - a. Dow Corning Corp.
    - b. General Electric Co.
    - c. Pecora Corp.
    - d. Substitutions: Refer to Section 01 62 00.
  - 2. Color: As selected by Architect from manufacturer's full range of available colors.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Clean glazing channels and framing members to receive glass immediately before glazing; remove coatings not firmly bonded to substrate.
- B. Apply primer to joint surfaces where recommended by sealant manufacturer.

#### **3.2 INSTALLATION**

- A. Comply with GANA Glazing Manual and Sealant Manual and glazing manufacturer recommendations and installation instructions.
  - 1. Do not allow glass to touch metal surfaces.
  - 2. Comply with applicable code requirements and NFPA 80 for glass in fire rated openings.
- B. Place setting blocks at quarter points in thin course of sealant.
- C. Install removable stops with glass centered in space with spacer shims at 2'-0" intervals on both sides of glass, 1/4" below sightline.
- D. Sealant Glazing: Fill gap between glass and stops with sealant to depth equal to bite of frame on glass but not more than 3/8" below sightline.
  - 1. Apply sealant to uniform and level line, flush with sightline; tool or wipe sealant surface for smooth appearance; at exterior locations tool sealant so water is carried away from glass.

**3.3 CLEANING**

- A. At areas subject to potential impact mark glass after installation by crossed streamers attached to framing and held away from glass; do not apply markers to surface of glass.
- B. Remove nonpermanent labels immediately after sealant cures; cure sealants for high early strength and durability.
- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged during construction period, including natural causes, accidents and vandalism.

**END OF SECTION**

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SECTION 09 21 00

GYPSUM BOARD ASSEMBLIES

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide gypsum board systems including gypsum board, light gage metal framing, joint treatment, acoustical accessories, and general accessories for complete installation.

1.2 REFERENCES

- A. ASTM C754: Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
- B. ASTM C840: Application and Finishing of Gypsum Board.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Openings: Obtain dimensions and locations from other trades and provide openings and enclosures for accessories, specialties, equipment, and ductwork.

1.4 SUBMITTALS

- A. Product Data: Furnish manufacturer's literature for framing, insulation, gypsum board, and acoustical accessories.
- B. Manufacturer's Certification: Furnish manufacturer's certification indicating products comply with Contract Documents and applicable codes.

1.5 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives, sealants, and caulks.
- B. Mock-Up: Provide Level 4 finish mock-up not less than 100 square feet in location acceptable to Architect. Approved mock-up may be incorporated into Project.

1.6 PROJECT CONDITIONS

- A. Do not begin installation of interior gypsum board until space is enclosed, space is not exposed to other sources of water, and space is free of standing water.
- B. Maintain areas to receive gypsum board at minimum 50 degree F for 48 hours prior to application and continuously after application until drying of joint compound is complete; comply with ASTM C840.
- C. Immediately remove from site gypsum board for interior use exposed to water, including gypsum board with water stains, with signs of mold, and gypsum board with mildew.

## PART 2 - PRODUCTS

### 2.1 SYSTEMS MANUFACTURERS

- A. National Gypsum Co.
- B. Georgia-Pacific Corp.
- C. United States Gypsum Co., USG Corp.
- D. Substitutions: Refer to Section 01 62 00.

### 2.2 MATERIALS

- A. System Description: Provide gypsum board assemblies including gypsum board, light gage metal framing, suspension system for gypsum board systems, joint treatment, acoustical accessories, and general accessories.
  - 1. Systems Responsibility: Provide products manufactured by or recommended by manufacturer of gypsum board to maintain single-source responsibility for system.
- B. Performance Requirements: Perform gypsum board systems work in accordance with recommendations of ASTM C754 and ASTM C840 unless otherwise specified.
  - 1. Loads: Comply with California Building Code requirements for design of metal framing for gypsum board systems.
    - a. Deflection: Maximum L/240 typical.
- C. Regulatory Requirements:
  - 1. Seismic Requirements: Comply with code requirements for seismic bracing.
- D. Framing: Comply with ASTM C754, 20 gage and lighter unless otherwise indicated; provide gages as recommended by manufacturer for spans and loads indicated and as required by applicable codes.
  - 1. Studs: ASTM C645, screw-type Cee-shaped.
  - 2. Runners: Match studs.
  - 3. Furring Members: ASTM C645, screw-type, hat-shaped.
    - a. Sound Rated Assemblies: Provide resilient channels where indicated and where required to provide required sound transmission classifications.
  - 4. Channels: ASTM C754.
  - 5. Fasteners and Anchorages: As recommended by gypsum board system manufacturer.



- E. Gypsum Board: Comply with ASTM C840; maximum permissible lengths; ends square cut, tapered edges on boards to be finished.
  - 1. Typical: ASTM C1396, Type X, fire rated gypsum board, unless otherwise indicated.
- F. Gypsum Board Accessories: Comply with ASTM C840.
  - 1. Provide protective coated steel corner beads and edge trim; type designed to be concealed in finished construction by tape and joint compound.
  - 2. Corner Beads: Manufacturer's standard metal beads.
  - 3. Edge Trim: "J", "L", "LK", or "LC" casing beads.
  - 4. Reinforcing Tape, Joint Compound, Adhesive, Water, Fasteners: Types recommended by system manufacturer and conforming to ASTM C475.
    - a. Typical Joint Compound: Chemical hardening type for bedding and filling, ready-mixed or powder vinyl type for topping.
  - 5. Control Joints: Back to back casing beads.
    - a. Back control joints with 4 mil thick polyethylene air seal.
- G. Acoustical Accessories:
  - 1. Acoustical Insulation: Preformed mineral fiber, ASTM C665, Type I; friction fit type without integral vapor barrier; as required to meet STC ratings indicated, or of thickness indicated.
  - 2. Acoustical Sealant: ASTM C919, type recommended for use in conjunction with gypsum board. Paintable, non-shrinking and non-cracking where exposed, nondrying, nonskinning, nonstaining, and nonbleeding where concealed.
    - a. Acoustical Sealant Manufacturers:
      - 1) USG/Sheetrock Acoustical Sealant.
      - 2) Tremco/Acoustical Sealant.
      - 3) Pecora/AC-20.
      - 4) Substitutions: Refer to Division 1.
  - 3. Electrical Box Pads: Provide at outlet, switch and telephone boxes in walls with acoustical insulation.
    - a. Electrical Box Pad Manufacturers for Non-Fire Rated Partitions:
      - 1) Harry A. Lowry & Associates (800.772.2521)/Lowry's Electrical Box Pads.
      - 2) Tremco Sheet Caulking (650.572.1656).
      - 3) Hevi-Duty Nelson (800.331.7325)/Putty Pads.
      - 4) Specified Technologies, Inc. (800.992.1180)/Putty Pads.
      - 5) Hilti, Corp./Hilti Box Pads.
      - 6) Substitutions: Refer to Section 01 62 00.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Metal Framing Erection: Erect metal framing in accordance with ASTM C754 and manufacturer's recommendations.
  - 1. Install members true to lines and levels to provide surface flatness with maximum variation of 1/8" in 10'-0" in any direction.
  - 2. Door Opening Framing: Install double studs at door frame jambs; install runners on each side of opening at frame head height between jamb studs and adjacent studs.
  - 3. Install metal framing backing where required for support of fixtures, cabinets, accessories and hardware.
  - 4. Coordinate installation of bucks, anchors, blocking, electrical and mechanical work which is to be placed in or behind partition framing; allow items to be installed after framing is complete.
- B. Gypsum Board Installation: Install in accordance with ASTM C840 and manufacturer's recommendations.
  - 1. Use screws when fastening gypsum board to furring and to framing.
  - 2. Erect gypsum board with ends and edges occurring over firm bearing.
    - a. Ensure joints of second layer do not occur over joints of first layer in double layer applications.
  - 3. Place control joints to be consistent with lines of building spaces and as directed by Architect.
    - a. Provide where system abuts structural elements.
    - b. Provide at dissimilar materials.
    - c. Lengths exceeding 30'-0" in partitions.
    - d. Ceiling areas exceeding 50'-0" or 2500 square feet.
    - e. Wings of "L", "U" and "T" shaped ceilings.
  - 4. Place corner beads at external corners; use longest practical lengths.
  - 5. Place edge trim where gypsum board abuts dissimilar materials.
  - 6. Tape, fill, and sand exposed joints, edges, corners and openings to produce surface ready to receive finishes; feather coats onto adjoining surfaces.
  - 7. Finishing: Comply with Gypsum Association (GA) "Levels of Gypsum Board Finish".
    - a. GA Level 4 (Typical): Provide three coat finishing and sanding is required for surfaces indicated to be painted; provide flush, smooth joints and surfaces ready for applied paint finishes.
  - 8. Remove and replace defective work.

**C. Acoustical Accessories Installation:**

1. Place acoustical insulation tight within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
2. Place acoustical sealant within partitions in accordance with manufacturer's recommendations; install acoustical sealant at gypsum board perimeter at:
  - a. Metal Framing: One or two beads.
  - b. Base layer and face layer.
  - c. Penetrations of partitions.
3. Tolerance: Maximum 1/4" space between gypsum board at floor, ceiling, and penetrations and sealed with acoustical sealant.
4. Install electrical box pads with pads molded and pressed on back and all sides of box, closing openings, in accordance with manufacturer's instructions, for complete acoustical barrier.

**END OF SECTION**

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SECTION 09 51 00

ACOUSTICAL CEILINGS

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Repair existing acoustical ceiling systems where required by Project; match existing system to extent in compliance with applicable codes and regulations.
- B. Related Sections:
  - 1. Divisions 21 through 28: Facilities services for ceiling penetrations.

1.2 REFERENCES

- A. ASTM C635: Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C636: Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- C. ASTM E580: Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate repair of acoustical ceiling systems with items installed above ceilings to ensure work above ceilings is complete, space is sufficient for items in ceiling while allowing required ceiling heights, and building is enclosed.

1.4 SUBMITTALS

- A. Product Data: Furnish manufacturers' literature.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with minimum five years successful experience in projects of similar type and scope; acceptable to manufacturer of integrated acoustical ceiling system.

1.6 SITE CONDITIONS

- A. Do not repair ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated and overhead mechanical work is completed, tested and approved.
  - 1. Do not allow acoustical ceiling units to be exposed to moisture; immediately remove acoustical ceiling units with stains, units with signs of mold, and units with mildew.

- B. Allow wet work to dry prior to commencement of installation.
- C. Maintain uniform temperatures of minimum 60 degrees F and humidity of 20% to 40% prior to, during and after installation.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEMS MANUFACTURERS**

- A. Original materials manufacturers.
- B. Armstrong World Industries, Inc.
- C. CertainTeed.
- D. Chicago Metallic Corp.
- E. USG Corporation.
- F. Substitutions: Refer to Section 01 62 00.

### **2.2 MATERIALS**

- A. System Description: Provide acoustical ceiling systems materials matching existing comparable materials.
- B. Regulatory Requirements:
  - 1. Seismic Design Requirements: Comply with California Building Code requirements for seismic bracing of ceiling suspension system, and with ASTM E580.
    - a. Ceiling Struts: Provide struts as detailed on Drawings and as required by code, placed maximum 12'-0" on center in both directions and within 6'-0" of each wall.
    - b. Slack Wires: Provide safety slack wires, two per fluorescent fixture on diagonally opposite corners and a single wire for each recessed down light.
  - 2. Fire Performance Characteristics: Provide products listed by Underwriters Laboratories (UL) or other independent testing laboratory acceptable to applicable authorities.
    - a. Flame Spread/Smoke Density: Provide products meeting code requirements for maximum 25 flame spread and maximum 450 smoke density.
- C. Suspension Systems: Comply with ASTM C635, as applicable to type of suspension system required for type of ceiling units indicated.
  - 1. Grid System: Match existing.

2. Attachment Devices: Size for 5 times design load indicated in ASTM C635, Table 1, Direct Hung.
3. Hanger Wires: Galvanized carbon steel, ASTM A641, soft temper, pre-stretched, yield-stress load of at least three times design load, but not less than 12 gage.
4. Straps, Tubes and Angles: Provide galvanized steel as required to meet state and local requirements for seismic design loads.
5. Structural Class: Minimum intermediate-duty system.
6. Edge Molding: Match existing.
7. Finish of Exposed Items: Match existing.
8. Maximum Allowable Deflection: L/360.

D. Acoustical Panels: Match existing.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Coordinate with other work supported by or penetrating through ceilings, including integral air handling systems, light fixtures, and other systems.

#### **3.2 INSTALLATION**

- A. Install new acoustical ceiling system components in accordance with manufacturer's recommendations and ASTM C636.
  1. Finished Ceilings: True to lines and levels and free from warped, soiled or damaged grid or acoustical units.
- B. Install after major above-ceiling work is complete; coordinate location of hangers with other work.
  1. Ensure suspension system is located to accommodate fittings and units of equipment which is to be placed after installation of ceiling grid.
- C. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest adjacent hangers and related carrying channels as required to span required distance.
- D. Install ceiling suspension system to resist seismic loads as required by state and local codes, including extra hanger wires and compression supports for ceilings and light fixtures.
- E. Hang system independently of walls, columns, ducts, pipes and conduit. Where suspension system members are spliced, avoid visible displacement of the longitudinal axis or face plane of adjacent members.

- F. Do not support lighting fixtures from or on main runners or cross runners if weight of fixture causes total dead load to exceed deflection capability.
  - 1. Support fixture loads independently or provide supplementary hangers located within 6" of each corner.
- G. Do not install fixtures so main runners and cross runners are eccentrically loaded; where fixture installation would produce rotation of runners, provide stabilizer bars.
- H. Install edge moldings at intersection of ceiling and vertical surfaces, using maximum lengths, straight, true to line and level; miter corners.
  - 1. Provide edge moldings at junctions with other ceiling finishes.
- I. Where required form expansion joints to accommodate movement and maintain visual closure without distorting system.
- J. Fit acoustic units in place, free from damaged edges or defects detrimental to appearance and function.
  - 1. Lay with pattern to match existing.
  - 2. Fit border units neatly against abutting surfaces.
- K. Install system level, in uniform plane and free from twist, warp and dents.
- L. Install hold-down clips where required by applicable codes and where ceiling is within 20'-0" of an exterior door.

### **3.3 ADJUSTING**

- A. Adjustment: Adjust sags or twists which develop in ceiling system and replace any part which is damaged or faulty.

**END OF SECTION**

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**SECTION 09 65 10**

**RESILIENT BASE**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Provide resilient base and accessories as required for complete finished installation.
- B. Related Sections:
  - 1. Section 09 68 10: Tile carpeting edge strips.

**1.2 SUBMITTALS**

- A. Product Data: Furnish manufacturer's product literature.
- B. Samples: Furnish samples of each base color and type.

**1.3 QUALITY ASSURANCE**

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives and resilient flooring.

**1.4 SITE CONDITIONS**

- A. Comply with manufacturer recommendations for site conditions but not less than following; maintain minimum 70 degree F air temperature at installation area for three days prior to, during, and for 24 hours after installation.
- B. Store materials in area of application; allow three days for material to reach same temperature as area.

**PART 2 - PRODUCTS**

**2.1 SYSTEMS MANUFACTURERS**

- A. Burke-Mercer Flooring Products.
- B. Roppe Rubber Corporation.
- C. Johnsonite, Inc.
- D. Substitutions: Refer to Section 01 62 00.

**2.2 MATERIALS**

- A. System Description: Provide resilient base and accessories as required for complete finished installation.



- B. Performance Requirements: Provide materials tested under ASTM E648, Flooring Radiant Panel Test, with results of 0.45 watts/sq. cm or higher.
- C. Resilient Base: Conform to ASTM F1861, with premolded end stops and external corners; 1/8" gage; provide coved base at hard floor surfaces, straight base at carpet unless otherwise indicated.
  - 1. Type: Extruded rubber, in rolls.
  - 2. Height: Match existing unless otherwise indicated.
  - 3. Color: Match existing unless otherwise indicated.
- D. Primers and Adhesives: Water-resistant nontoxic types recommended by base manufacturer for specified material and application.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Apply to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required.
  - 1. Fit base joints tight and vertical.
  - 2. Maintain minimum measurement of 18" between joints.
- B. Miter internal corners; use molded sections for external corners and exposed ends.
- C. Install base on solid backing, adhere tightly to wall and floor surfaces; fill voids along top edge of base with manufacturer's recommended adhesive filler.
- D. Scribe and fit to door frames and other obstructions.
- E. Install straight and level to variation of plus or minus 1/8" over 10'-0".

#### **3.2 CLEAN-UP**

- A. Remove excess adhesive from floor, base and wall surfaces without causing damage.
- B. Clean surfaces in accordance with manufacturer's recommendations.

**END OF SECTION**

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SECTION 09 65 20

RESILIENT TILE FLOORING

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Install Owner furnished static resistant (conductive) resilient tile flooring; provide accessories as required for complete finished installation and not furnished by Owner.
- B. Related Sections:
  - 1. Section 09 65 10: Resilient rubber base.
  - 2. Section 09 68 10: Tile carpeting edge strips.

1.2 SUBMITTALS

- A. Product Data: Furnish manufacturer's product literature for accessories not furnished by Owner.

1.3 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives.

1.4 SITE CONDITIONS

- A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8" in 10'-0".
- B. Ensure concrete floors are dry and exhibit negative alkalinity, carbonizing, and dusting.
- C. Maintain minimum 70 degree F air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.
- D. Store flooring materials in area of application; allow three days for material to reach same temperature as area.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- A. System Description: Install Owner furnished static resistant resilient tile flooring and accessories.
- B. Performance Criteria:
  - 1. Conductivity (Static Resistance): Meet UL Standard 779, Standard for Electricity Conductive Flooring.

- C. Static Resistant Vinyl Composition Tile (VCT): Owner furnished.
  - 1. Static Dissipative Flooring: Provide accessories for conductive type tile flooring designed to conduct static charges to grounding cables preventing static buildup. Provide accessories as required for complete static dissipative flooring system.
- D. Edge Strips: Provide homogeneous vinyl or rubber, tapered or bullnose edge if not furnished by Owner, color as selected by Architect.
- E. Sub-Floor Filler: White premixed latex-cement paste designed for providing thin solid surface for leveling and minor ramping of subsurface to adjacent floor finishes.
  - 1. Use material capable of being applied and feathered out to adjacent floor without spalling.
- F. Primers and Adhesives: Waterproof nontoxic types as recommended by flooring manufacturer for specified material and application.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Conform to manufacturer's recommendations for preparation and to ASTM F710.
- B. Remove sub-floor ridges and bumps; fill low spots, cracks, joints, holes and defects with sub-floor filler.
- C. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface; prohibit traffic until filler is cured.
- D. Test substrate for moisture content in accordance with flooring manufacturer recommendations; where moisture content exceeds manufacturer recommendations take measures recommended by flooring manufacturer.

#### **3.2 INSTALLATION**

- A. Conform to manufacturer recommendations and installation instructions including special instructions to ensure static resistance (conductivity) of flooring installation.
  - 1. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.
- B. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation; spread only enough adhesive to permit installation of flooring before initial set.
- C. Set flooring in place using methods to ensure full adhesion.
- D. Lay flooring with joints parallel to building lines to produce symmetrical pattern.
- E. Install minimum 1/2 tile at room and area perimeter.

- F. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.
- G. Install edge strips at unprotected and exposed edges where flooring terminates.
- H. Scribe flooring to walls, columns, floor outlets and other appurtenances, to produce tight joints.
- I. Consult with Architect for floor pattern desired in each area.
- J. Edge Strips: Install where edge of tile would otherwise be exposed; butt to flooring without gaps; set in adhesive.

### **3.3 CLEAN-UP AND PROTECTION**

- A. Remove excess adhesive from floor, base and wall surfaces without causing damage.
- B. Prohibit traffic from floor for 48 hours after installation.

**END OF SECTION**

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SECTION 09 68 10

TILE CARPETING

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide carpet tile including edge strips where carpeting terminates at other floor finishes and accessories as required for complete finished installation.

1. Match existing.

1.2 SUBMITTALS

- A. Product Data: Prior to final acceptance of carpet tile installation, submit manufacturer's detailed maintenance recommendations for care, cleaning and repair of carpet tiles installed.
- B. Shop Drawings: Clearly indicate carpet tile layout, direction of carpet tiles, adhesive to be used, method of integrating edge strips with carpet tile, and installation procedures.
- C. Samples: Submit samples of each carpet tile type and color, and of each color of edge strip.
- D. Certificate of Compliance: Furnish manufacturer's certificate of compliance stating each material delivered conforms to Specifications.
- E. Maintenance Recommendations: Prior to final acceptance of carpet tile installation, furnish carpet tile manufacturer's detailed maintenance recommendations for care, cleaning and repair of carpet tiles installed.
- F. Maintenance Materials: Submit unused carpet tiles. Box unused carpet tiles and mark boxes indicating color and location installed.

1.3 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for carpet systems and adhesives.
- B. Installer Qualifications: Firm with minimum five years successful experience in carpet tile installation and approved by carpet tile manufacturer.
1. Upon request, submit letter from carpet manufacturer stating installer is acceptable.

1.4 PROJECT CONDITIONS

- A. Do not commence carpet tile installation until painting and finishing work is complete and ceiling and other overhead work has been tested, approved and completed, unless specifically approved.

- B. Maintain room temperature at minimum 60 degrees F for at least 24 hours prior to installation; relative humidity shall be approximately that at which area is to be maintained.
- C. Schedule, receive and place carpet tile on floors indicated; protect from soiling and damage during transit, storage, and installation.

## **1.5 WARRANTY**

- A. Extended Correction Period: Provide for promptly making good or replacing defective materials or workmanship. Repairs shall take place within ten days of written notification.
  - 1. Period: Two years.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEMS MANUFACTURERS**

- A. Original carpet tile manufacturer.
- B. Mannington Commercial Division, Mannington Carpets, Inc.
- C. Lees Carpets, Division of Burlington, Inc.
- D. Interface Flooring Systems, Inc.
- E. Milliken Contract Carpets.
- F. Substitutions: Refer to Section 01 62 00.

### **2.2 MATERIALS**

- A. System Description: Provide carpet tile including edge strips where carpeting terminates at other floor finishes and accessories.
- B. Regulatory Requirements: Carpet tiles shall have passed following fire and smoke tests.
  - 1. DOC-FF-1-70: Pass.
  - 2. ASTM E662 (Smoke Density): 450 or less.
  - 3. ASTM E648 or NFPA 253 (Flooring Radiant Panel Test): 0.45 or higher.
- C. Design Criteria: Provide carpet materials that bear Carpet and Rug Institute "Green Label Plus".
- D. Performance Requirements, Static: Carpet tile shall develop less than 3.0 kilovolts of static at 70 degrees F and 20 percent relative humidity.
- E. Carpet Tile: Match existing as approved by Architect and Owner.
  - 1. Yarn: Sixth or later generation continuous filament soil hiding nylon.

- F. Adhesive: Nontoxic type recommended by carpet tile manufacturer to suit application and expected service.
- G. Leveling and Ramping Material: Latex-cement material designed for providing thin solid surface for leveling and minor ramping of subsurface to adjacent floor finishes.
  - 1. Use material capable of being applied and feathered out to adjacent floor without spalling.
- H. Edge Strips: Vinyl or rubber; manufacturer's standard colors as selected.
- I. Accessories: Provide as required for complete finished installation.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Clean floors of dust, dirt, solvents, oil, grease, paint, plaster and other substances detrimental to proper performance of adhesive and carpet tile; allow floors to thoroughly dry.
- B. Ensure floors are level, with maximum surface variation of 1/4" in 10 feet.
- C. Ensure concrete floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.
- D. Use leveling and ramping material to patch cracks, small holes, leveling and for ramping to provide finished carpet tile within 1/2" of adjacent flooring materials.
- E. Test substrate for moisture content in accordance with flooring manufacturer recommendations; where moisture content exceeds manufacturer recommendations take measures recommended by flooring manufacturer.

#### **3.2 INSTALLATION**

- A. Install carpet tiles in accordance with manufacturer's recommendations and installation instructions.
  - 1. Adhere tiles to subfloor unless otherwise approved.
- B. Prime substrate if required and as recommended by manufacturer. Spread adhesive in quantity recommended by manufacturer to ensure proper adhesion. Apply only enough adhesive to permit proper adhesion of carpet tile before initial set.
- C. Lay carpet tile with run of pile in direction of anticipated traffic; do not change run of pile in any one room or from one room to next where continuous through a wall opening.
  - 1. Finished installation to provide monolithic carpet tile appearance as approved by Architect.

- D. Cut and fit carpet tile neatly around projections through floor and to walls and other vertical surfaces.
- E. Fit carpet tiles snugly to walls or other vertical surfaces, leaving no gaps.
- F. Lay installation tight and flat to subfloor well fastened and uniform in appearance; ensure monolithic color, pattern and texture match within any one area.
- G. Edging Strips: Install in accordance with manufacturer recommendations and installation instructions.
  - 1. Install edging strips where carpet terminates at other floor coverings.
  - 2. Use full length pieces only, butt tight to vertical surfaces. Where splicing cannot be avoided, butt ends tight and flush.
- H. Do not place heavy objects such as furniture on carpet tiled surfaces for not less than 24 hours or until adhesive is set.

### **3.3 CLEANING**

- A. Upon completion of carpet tile installation in each area, visually inspect carpet tile installed in that area and immediately remove dirt, soil and foreign substance from exposed face.
- B. Clean in accordance with manufacturer's recommendations and as specified in Section 01 77 00 – Contractor Close-out.
- C. Inspect adjacent surfaces and remove marks and stains caused by carpet tile installation.
- D. Remove packaging materials, carpet tile scraps, and other debris from carpet tile installation.

**END OF SECTION**



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SECTION 09 90 00

PAINTING AND COATING

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide painting and finishing of interior exposed items and surfaces requiring field painting and finishing including shop primed items.
  - 1. Specified surface preparation, priming and coats of paint are in addition to shop-priming and surface treatment specified under other sections of work.
  - 2. Painting and finishing includes field finishing of items not listed as "Surfaces not to be Painted" unless clearly indicated otherwise.
  - 3. Painting and finishing includes field finishing of select shop finished items where indicated as required to match adjacent surfaces, such as mechanical grilles and registers.
  - 4. Field paint exposed bare and covered pipes, ducts, and hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work in occupied spaces.
  - 5. Wood Doors: Contractor option to factory finish or field finish, coordinate with Section 08 14 00 - Wood Doors.
- B. Surfaces Not To Be Painted:
  - 1. Finished items including finished metal surfaces.
  - 2. Walls and ceilings in concealed areas and generally inaccessible areas.
  - 3. Moving parts of operating mechanical and electrical units.
  - 4. Labels: Keep equipment identification and fire rating labels free of paint.
- C. Related Sections: Shop priming of ferrous metal items is included under various Specification sections.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information, including paint label analysis and application instructions for each material.
- B. Samples: Submit samples for review of color and texture; provide list of material and application for each coat of each finish sample.
  - 1. Brush-Outs: Submit samples of each color and material with texture to simulate actual conditions, on hardboard.
    - a. Submit 8" by 10" samples of wood finishes on actual wood surfaces; label and identify each as to location and application.

2. Field Samples: Duplicate painted finishes of approved samples on actual wall surfaces and components for approval prior to commencing work.

- a. Size: Minimum 100 sf located where approved.
- b. Components: One full component as directed.
- c. Simulate finished lighting conditions for review.

- C. Manufacturer Certificates: Furnish certificates from each manufacturer stating materials are top quality lines and suitable for intended use on this Project.

### **1.3 QUALITY ASSURANCE**

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for paints and coatings.

### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, with:
  1. Name of material, color and sheen.
  2. Manufacturer's name, stock number and date of manufacture.
  3. Contents by volume, for major pigment and vehicle constituents.
  4. Thinning and application instructions.

### **1.5 SITE CONDITIONS**

- A. Apply water-base paints when temperature of surfaces and surrounding air are between 50 and 90 degrees F.
- B. Do not apply paint in rain, fog or mist; or when relative humidity exceeds 85 percent; or to damp or wet surfaces.
- C. Painting may be continued during inclement weather if areas to be painted are enclosed and heated within temperature limits specified.
- D. Provide additional temporary ventilation during interior application of paints to eliminate volatile organic compound (VOC) emissions from interior spaces as quickly as possible.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEMS MANUFACTURERS**

- A. Benjamin Moore & Co.
- B. Sherwin-Williams Co.
- C. Pittsburgh Paints, PPG Pittsburgh Paints, including Glidden Professional.
- D. Dunn-Edwards Corp.

- E. Kelly Moore Paint Co.
- F. Vista Paint Co.
- G. Frazee Paint Co.
- H. Substitutions: Refer to Section 01 62 00.

## **2.2 MATERIALS**

- A. System Description: Provide painting and finishing of exposed items and surfaces requiring field painting and finishing including shop primed items.
  - 1. Definition: "Painting" and "coating" as used herein means systems including primers, emulsions, enamels, stains, sealers and fillers, whether used as prime, intermediate or finish coats.
- B. Regulatory Requirements:
  - 1. Volatile Organic Compound (VOC) Emissions: Furnish materials approved for use by applicable air quality management district for limitations of volatile organic compounds for architectural or special coatings as applicable.
- C. Material Quality: Provide top line quality commercial grade (professional painter) paints; materials not bearing manufacturer's identification as their top line product shall not be acceptable.
  - 1. Primers: Provide premium grade primers recommended by paint manufacturer for substrates indicated and for finish systems specified.
  - 2. Undercoats and Barrier Coats: Provide undercoat paints produced by same manufacturer as finish coats; use only thinners approved by paint manufacturer, and use only within recommended limits.
  - 3. Finish Coats: Provide finish coats capable of being washed with mild detergent without loss of color, sheen, or pigments.
    - a. Color pigments: Pure, non-fading, applicable types to suit substrates and service indicated; no lead content permitted.
  - 4. Finish Coat Coordination: Provide finish coats which are compatible with prime paints, undercoats, and barrier coats used.
    - a. Review other Specification sections in which prime paints are provided; ensure compatibility of total coatings systems.
    - b. Upon request from other trades furnish information on characteristics of finish materials proposed for use.
    - c. Provide barrier coats over incompatible primers or remove and prime as required.
    - d. Notify Architect in writing of any anticipated problems in use of specified coating systems with substrates primed by others.

- D. Colors and Finishes: Prior to commencement of painting work, Architect will furnish color chips for surfaces to be painted.
  - 1. Use of proprietary names in color selection is not intended to imply exclusion of equivalent products of other manufacturers.
  - 2. Final acceptance of colors will be from samples applied on site.
  - 3. Colors: As indicated on Finish Schedules, as directed by Architect where not otherwise indicated.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Inspection: Examine areas and conditions under which painting work is to be applied.
  - 1. Start of painting work indicates acceptance of surfaces and conditions of surfaces and conditions within any particular area.
  - 2. Where exposed items or surfaces are not specifically mentioned in Schedules, paint same as adjacent similar materials or areas.
  - 3. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to a durable paint film.
- B. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified for substrate condition.
  - 1. Existing Painted Finishes:
    - a. Clean existing painted surfaces and remove oil, grease, dust, stains, scale, efflorescence, mildew, mold, algae, blisters, and non-adhering paint.
    - b. Measure adhesion of existing paints using ASTM D3359 tape test; remove existing coatings where poor adhesion is indicated.
    - c. Feather edges of severely deteriorated paint where several coats are removed as part of cleaning, to provide smooth transition for new paint.
    - d. Fill holes, cracks, and defects and fill and sand smooth, ready for new paint finish.
- C. Remove hardware, accessories, and items in place and not to be painted, or provide protection prior to surface preparation and painting; after painting reinstall removed items.
- D. Clean surfaces before applying paint; remove oil and grease prior to mechanical cleaning; program cleaning so contaminants from cleaning process do not fall onto wet, newly painted surfaces.

- E. Wood: Clean wood surfaces of dirt, oil, and other foreign substances; sandpaper smooth surfaces exposed to view, and dust off.
  - 1. Scrape and clean seasoned knots and apply thin coat of recommended knot sealer, before application of priming coat.
  - 2. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job; prime edges, ends, faces, undersides, and backsides of wood.
  - 3. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler; sandpaper smooth when dry.
- F. Ferrous Metals: Touch up shop-applied prime coats wherever damaged using same type of primer as applied in shop or barrier coat compatible with finish paint.
  - 1. Bare Surfaces: Clean surfaces that are not galvanized or shop-coated, of oil, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
  - 2. Galvanized Surfaces: Clean free of oil and surface contaminants, using non-petroleum based solvent; primer and touch-up primer to be zinc-rich primer.
- G. Mix painting materials in accordance with manufacturer's directions.
- H. Store materials in tightly covered containers; maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- I. Stir materials before application to produce mixture of uniform density, and stir as required during application; do not stir surface film into material, if necessary, strain material before using.

### **3.2 APPLICATION**

- A. Apply paint in accordance with manufacturer's directions; use applicators and techniques best suited for substrate and type of material being applied.
  - 1. Apply additional coats when stains or blemishes show through final coat, until paint is a uniform finish, color and appearance.
  - 2. Provide extra attention during application to assure dry film thickness at corners and crevices is equivalent to that of flat surfaces.
  - 3. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces; paint surfaces behind permanently-fixed equipment and furniture with prime coat only.
  - 4. Finish doors on tops, bottoms and side edges same as faces.
  - 5. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 6. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
  - 7. Sand lightly between coats when recommended by system manufacturer.

- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated or prepared for painting as soon as practicable after preparation.
  - 1. Allow time between successive coatings to permit proper drying.
  - 2. Do not recoat until paint feels firm and does not deform or feel sticky under moderate thumb pressure.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as recommended by coating manufacturer.
- D. Prime Coats: Apply to items not previously primed; recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat.
- E. Finish Coats: Provide even texture; leave no laps, irregularity in texture, skid marks, or other surface imperfections.
  - 1. Opaque Finishes: Provide opaque, uniform finish, color and coverage; cloudiness, spotting, holidays, brush marks, runs, sags, ropiness, and other surface imperfections are not acceptable.
  - 2. Transparent and Stained Finishes: Produce glass smooth surface film of even luster; provide with no cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, and other surface imperfections.
- F. Completed Work: Match approved samples for color, texture and coverage; remove, refinish or repaint work not accepted.

### 3.3 PAINTING SCHEDULE

- A. Interior Work: Provide following paint systems.
  - 1. Gypsum Board Systems: Match existing sheens in similar applications.
    - a. 1st Coat: Universal primer.
    - b. 2nd and 3rd Coat: Interior latex or acrylic latex emulsion.
  - 2. Metal: Semigloss sheen.
    - a. 1st Coat: Touch-up primer, prime if none.
    - b. 2nd and 3rd Coat: 100% acrylic enamel.
  - 3. Stained Wood: Satin rubbed sheen.
    - a. 1st Coat: Wood stain.
    - b. 2nd Coat: Sanding sealer.
    - c. 3rd and 4th Coat: Acrylic modified urethane.
    - d. Fill open grained wood with filler and wipe before 2nd coat.

B. Sheens: Comply with ASTM D523, reflectance of paint.

1. Flat: 1-10.
2. Satin: 15-30.
3. Eggshell: 30-45.
4. Semigloss: 45-75.
5. Gloss: 75-100.

### **3.4 CLEAN-UP, PROTECTION, AND REPAIR**

A. Clean-Up: During progress of work, remove discarded paint materials, rubbish, cans and rags from site at end of each work day.

1. Clean glass and paint-spattered surfaces immediately by proper methods of washing and scraping, using care not to scratch or damage finished surfaces.

B. Protection: Protect work of other trades, whether to be painted or not; correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

1. Provide "Wet Paint" signs to protect newly-painted finishes.
2. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

C. Repair: At completion of work of other trades, touch-up and restore damaged surfaces or defaced painted surfaces.

**END OF SECTION**

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**SECTION 10 11 10**

**MARKERBOARDS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Provide liquid marker type whiteboards with frames, chalk rail, hardware, and accessories as required for complete installation.

**1.2 SUBMITTALS**

- A. Shop Drawings: Clearly indicate board sizes and layout, method of attachment, accessories, trim profiles, details and finish.
- B. Samples: Furnish sample whiteboard surfaces with samples of aluminum frame and chalk rail, in selected colors and finish.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver materials to site until areas in which they are to be installed are ready to receive them.
- B. Deliver materials to site in protective covering in a manner to protect finishes.

**PART 2 - PRODUCTS**

**2.1 SYSTEMS MANUFACTURERS**

- A. Claridge Products and Equipment, Inc.
- B. Greensteel Division of PolyVision Corporation.
- C. Aarco Products, Inc.
- D. Substitutions: Refer to Section 01 62 00.

**2.2 MATERIALS**

- A. System Description: Provide liquid marker type whiteboards with frames, chalk rail, hardware, and accessories.
- B. Steel Sheet for Porcelain Enameling: ASTM A424, minimum 24 gage.
- C. Aluminum Extrusions: ASTM B221, minimum 0.062" wall thickness.
- D. Aluminum Sheet: ASTM B209, minimum 0.015" thick.
- E. Galvanized Steel Sheet: ASTM A1011 or A1008, Class 1; ASTM A924 and A653, G90 coating; minimum 26 gage (0.0179").



- F. Tempered Hardboard: Manufacturer's standard material.
- G. Plywood: PS 1, manufacturer's standard.

## **2.3 FABRICATION**

- A. Markerboards (Whiteboards): Porcelain writing surface manufactured specifically for use with liquid marker systems.
  - 1. Type:
    - a. Claridge/LCS Liquid Chalk System.
    - b. Greensteel/Dry Marker Board.
    - c. Lemco/Markerboards.
    - d. Substitutions: Refer to Section 01 62 00.
  - 2. Core: Minimum 3/8" thick plywood.
  - 3. Balance porcelain writing surface with aluminum or sheet steel backing, aluminum foil is not acceptable.
  - 4. Color: White.
- B. Frames: Extruded aluminum, factory applied, concealed fastening; integral chalk rail with molded end closures; anodized finish, matching Architect-approved sample.
  - 1. Framed Units: Fabricate one piece units without joints unless sizes indicated are not available as one piece units.
  - 2. Factory Fabricate: Factory fabricate except where too large for shipping.
- C. Attachment Hardware: Manufacturer's standard fully concealed attachment system for securing units to wall surfaces.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Securely mount whiteboards in accordance with manufacturer's recommendations, level and true to line.
- B. Cleaning: At completion of work, clean surfaces and trim, leaving ready for use.

**END OF SECTION**

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SECTION 10 14 00

SIGNAGE

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide general signage as indicated complete with attachment devices and accessories as required for complete installation.
- B. Related Sections:
  - 1. Division 26: Photoluminescent exit signs.

1.2 SUBMITTALS

- A. Product Data: Furnish manufacturer's literature and indicate each sign type, style, color, and method of attachment.
- B. Shop Drawings: Furnish listing of sign types, lettering and locations, along with dimensions of each sign.

1.3 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Package separately or in like groups of names, labeled as to names enclosed; include installation template, attachment system and installation instructions.

**PART 2 - PRODUCTS**

2.1 SYSTEMS MANUFACTURERS

- A. ASI Modulex, ASI Sign Systems, Inc.
- B. Mohawk Sign Systems.
- C. Vomar Products, Inc.
- D. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- A. System Description: Provide signage as indicated with attachment devices and accessories.

- B. Regulatory Requirements: Provide signs for assuring access for persons with disabilities in accordance with state and federal regulations.
  - 1. California Regulations: Comply with California Building Code.
  - 2. Federal Regulations: Comply with Americans with Disabilities Act (ADA) Standards.
- C. Tactile Exit Door Signs: Provide colored plastic/photopolymer signs, conforming to California Building Code Section 1011.3 and ADA Standards for signs for permanent rooms, with tactile raised and Braille characters; concealed mounting system.
  - 1. Colors: As selected by Architect.
  - 2. Size and Style: As indicated on Drawings.
- D. Room Identification and Direction Signs: Provide signs conforming to California and ADA Standards for permanent signs, total thickness 0.125"; provide raised and Braille characters conforming to California and ADA Standards; concealed mounting.
  - 1. Material: Manufacturer's standard colored plastic/photopolymer signs; color as indicated, as selected by Architect from manufacturer's full range of colors where not otherwise indicated.
    - a. Texture: Smooth.
  - 2. Sizes and Styles: As indicated on Drawings, as directed by Architect where not otherwise indicated.
- E. Tactile Emergency Evacuation Signs: Silk-screened polycarbonate with screening on back and with tactile and Braille information conforming to California requirements and ADA Standards.
  - 1. Information: Provide sign system with information as required by applicable authorities for emergency egress.
  - 2. Silk-Screen Colors: As selected by Architect.
    - a. Silk-screen Lacquer: Similar to Advanced Screen Products/Industrial Gloss Lacquer Silk-screen Ink; colors as selected by Architect.
  - 3. Size and Style: As indicated on Drawings and acceptable to applicable authorities.
  - 4. Attachment: Method subject to Architect approval.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Install signs in accordance with manufacturer recommendations and installation instructions, free from distortions and defects.

- B. Tactile Exit Door Signs: Install at doors with lighted "EXIT" signs; apply after walls are finished.
  - 1. Location: Mount signs at 48" to 60" height as required by applicable codes on strike side of door.
  - 2. Install level, in line, in accordance with the manufacturer's recommendations and ADA Standards to allow a person to approach within 3" of signs without being within a door swing and without encountering protruding objects.
  - 3. Clean and polish, remove excess adhesive.
- C. Room Identification and Direction Signs: Install signs after walls are finished.
  - 1. Location: Mount signs at 48" to 60" height as required by applicable codes on strike side of door for room identification signs, where indicated for direction signs.
  - 2. Install signs level, in line, in accordance with the manufacturer's recommendations, California Building Code and ADA Standards.
  - 3. Install room identification signs at doors to allow a person to approach within 3" of signs without being within a door swing and without encountering protruding objects.
  - 4. Clean and polish, remove excess adhesive.
- D. Emergency Evacuation Signs: Install signs after walls are finished.
  - 1. Location: Mount signs at locations indicated, as directed by Architect and applicable authorities if not otherwise indicated.
  - 2. Install signs level and in accordance with the manufacturer's recommendations and requirements of applicable authorities.
  - 3. Clean and polish.

**END OF SECTION**

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**SECTION 23 00 00**

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**HEATING, VENTILATING AND AIR CONDITIONING (HVAC) BASIC REQUIREMENTS**

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**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Work included in 23 00 00, HVAC Basic Requirements applies to Division 23, HVAC work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of heating, ventilating and air conditioning 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 items of work provided.
  - 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 items.
  - 5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's representative, and other reviewing entity whose approval is required to obtain systems acceptance.

**1.2 RELATED SECTIONS**

- A. Contents of Section applies to Division 23, HVAC 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

### 1.3 REFERENCES AND STANDARDS

- A. References and Standards per Division 01, General Requirements, individual Division 23, HVAC 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. ABMA - American Bearing Manufacturers Association
  - 3. ADA - Americans with Disabilities Act
  - 4. AHRI - Air-Conditioning Heating & Refrigeration Institute
  - 5. AMCA - Air Movement and Control Association

6. ANSI - American National Standards Institute
7. ASHRAE Guideline 0, The Commissioning Process
8. ASME - American Society of Mechanical Engineers
9. ASPE - American Society of Plumbing Engineers
10. ASSE - American Society of Sanitary Engineering
11. ASTM - ASTM International
12. AWWA - American Water Works Association
13. CFR - Code of Federal Regulations
14. CISPI - Cast Iron Soil Pipe Institute
15. EPA - Environmental Protection Agency
16. ETL - Electrical Testing Laboratories
17. GAMA - Gas Appliance Manufacturers Association
18. HI - Hydraulic Institute Standards
19. IAPMO - International Association of Plumbing & Mechanical Officials
20. IFGC - International Fuel Gas Code
21. ISO - International Organization for Standardization
22. MSS - Manufacturers Standardization Society
23. NEC - National Electric Code
24. NEMA - National Electrical Manufactures Association
25. NFPA - National Fire Protection Association
26. NFGC - National Fuel Gas Code
27. NRCA - National Roofing Contractors Association
28. NSF - National Sanitation Foundation
29. OSHA - Occupational Safety and Health Administration
30. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
31. TEMA - Tubular Exchanger Manufactures Association

- 32. TIMA - Thermal Insulation Manufacturers Association
- 33. UL - Underwriters Laboratories, Inc.
- D. See Division 23, HVAC individual Sections for additional references.
- E. 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.
- F. 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.
- G. Piping and duct insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

#### 1.4 SUBMITTALS

- A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 23, HVAC 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. In addition:
  - 1. "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.
  - 2. 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 zip file per specification division containing a separate file for each Specification Section. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. Deviations will be returned without review.
  - 3. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 23, HVAC Sections.
  - 4. 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.

- a. 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 items. Highlight connections by/to other trades.
  - b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 23, HVAC Specification Sections for specific items required in product data submittal outside of these requirements.
  - c. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
  - d. For vibration isolation of equipment, list make and model selected with operating load and deflection.
  - e. See Division 23, HVAC individual Sections for additional submittal requirements outside of these requirements.
5. Maximum of two reviews of submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
  6. 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.
  7. 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 Section 23 05 48, Vibration and Seismic Controls for HVAC Equipment. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
  8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required by Division 23, HVAC Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
  9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.

10. Substitutions and Variation from Basis of Design:

- a. 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.
- b. 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.

11. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, equipment, ductwork and piping layout plans, and control wiring diagrams. Reference individual Division 23, HVAC Specification Sections for additional requirements for shop drawings outside of these requirements.

- a. Provide Shop Drawings indicating access panel locations for items that require Code or maintenance access, size and elevation for approval prior to installation.

12. Samples: Provide samples when requested by individual Sections.

13. Resubmission Requirements:

- a. 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. Cloud changes in the submittals.
  - 1) Resubmit for review until review indicates no exception taken or make "corrections as noted".
  - 2) When submitting drawings for Engineers re-review, clearly indicate changes on drawings and "cloud" any revisions. Submit a list describing each change.

14. Operation and Maintenance Manuals, Owners Instructions:

- a. Submit, at one time, electronic files (PDF format) on CD/DVD of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items 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.
  - 1) 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.
  - 2) 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, quantities, relevant to each piece of equipment: belts, motors, lubricants, and filters.
  - 3) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Sections.
  - 4) Include product certificates of warranties and guarantees.
  - 5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
  - 6) Include copy of startup and test reports specific to each piece of equipment.
  - 7) Include copy of final air and water systems balancing log along with pump, fan and distribution system operating data.
  - 8) Include commissioning reports.
  - 9) Include copy of valve charts/schedules.
  - 10) 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.
- b. 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 23 00 00, HVAC Basic Requirements Article titled "Demonstration".

- c. 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.

15. Record Drawings:

- a. 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 items. Include items changed by field orders, supplemental instructions, and constructed conditions.
- b. Record Drawings are to include equipment and fixture/connection schedules, control dampers, fire smoke dampers, fire dampers, valves, bottom of pipe, duct and equipment elevations and dimensioned locations for all distribution systems (hydronic and air). Invert elevations and dimensioned locations for underground systems below grade to 5-feet outside building that accurately reflect "as constructed or installed" for project.
- c. At completion of project, input changes to original project 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.
- d. See Division 23, HVAC individual Sections for additional items to include in record drawings.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Work and materials installed to conform with all local, State, Federal and other applicable laws and regulations.
- B. 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.
- C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.
- D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

- E. Provide products that are UL listed.
- F. ASME Compliance: ASME listed water heaters and boilers with an input of 200,000 BTUH and higher, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.
- G. Provide safety controls required by National Boiler Code (ASME CSD 1) for boilers and water heaters with an input of 400,000 BTUH and higher.

#### 1.6 WARRANTY

- A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Contracting and Procurement Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC 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.

#### 1.7 COORDINATION DOCUMENTS

- A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, equipment, fire sprinklers, plumbing, cable trays, lights, and electrical services with architectural and structural requirements, and other trades (including ceiling suspension, and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, 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.
- B. Advise Architect in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.
- C. 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.
- D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

### **PART 2 - PRODUCTS**

#### 2.1 MANUFACTURERS

- A. Provide like items from one manufacturer, including but not limited to pumps, fans, valves, control devices, air handlers, vibration isolation devices, etc.

## 2.2 MATERIALS

- 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 approved or have adequate approval or be acceptable by State, County, and City authorities.
- B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.
- C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.
- D. 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.

## 2.3 ACCESS PANELS

- A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.
- B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 23, HVAC Sections. In absence of specific requirements in Division 01, General Requirements, comply with the following:
  - 1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
    - a. Ceiling access panels to be minimum 24-inch by 24-inch required and approved size.
    - b. Wall access panels to be minimum of 12-inch by 12-inch required and approved size.
    - c. Provide screwdriver operated catch.
    - d. Manufacturers and Models:
      - 1) Drywall: Karp KDW.

- 2) Plaster: Karp DSC-214PL.
- 3) Masonry: Karp DSC-214M.
- 4) 2 hour rated: Karp KPF-350FR.
- 5) Manufacturers: Milcor, Elmdor, Acudor or approved equivalent.

## **PART 3 - EXECUTION**

### **3.1 ACCESSIBILITY AND INSTALLATION**

- A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.
- B. Install equipment having components requiring access (i.e., drain pans, drains, control operators, valves, motors and vibration isolation devices) 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 including all appurtenances recommended in manufacturer's installation instructions, at no additional charge to Owner. 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. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
    - a. 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 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, seismic flexible joints, 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 for coordinating installation of piping systems.

2. Include provisions for servicing and removal of equipment without dismantling piping.

F. Plenums:

1. Plenums: Materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723. Immediately notify Architect / Engineer of any discrepancy.

### 3.2 SEISMIC CONTROL

- A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, Section 23 05 48, Vibration and Seismic Controls for HVAC Equipment, and individual Division 23 HVAC Sections.

B. Piping and Ductwork:

1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA or local requirements.

- C. Provide means to prohibit excessive motion of mechanical equipment during earthquake.

### 3.3 REVIEW AND OBSERVATION

- A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC 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 system installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. After major equipment is installed.
5. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch:



1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Mechanical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the mechanical systems are ready for final punch.
2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

### 3.4 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 23, HVAC 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 ductwork, and wiring to point of connection. Where existing systems are being utilized, clean existing distribution systems (ductwork, piping, fans, air handlers) prior to connecting new ductwork or piping.
  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 to a minimum.
    - a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
  4. Organize work to minimize duration of power interruption.

### 3.5 CUTTING AND PATCHING

- A. Confirm Cutting and Patching requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
  1. 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).
  2. 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.

3. 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.
4. 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, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

### 3.6 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.
- B. Maintain design intent where equipment other than as shown as Basis of Design in Contract Documents is provided. Where equipment requires ductwork or piping arrangement, controls/control diagrams, or sequencing different from that indicated in Contract Documents, provide at no additional cost to Owner.

### 3.7 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 23, HVAC Sections and the following:
  1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, 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 items until in service.

### 3.8 DEMONSTRATION

- A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

- B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's 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 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC 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.

### 3.9 CLEANING

- A. Confirm Cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.
- B. Upon completion of installation, 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.

### 3.10 INSTALLATION

- A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.
- B. Install equipment and fixtures 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, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
  - 1. Do not place equipment in sustained operation prior to initial balancing of HVAC systems.
- D. Provide miscellaneous supports/metals required for installation of equipment, piping and ductwork.

### 3.11 PAINTING

- A. Confirm Painting requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:

23 00 00 - 15      HEATING, VENTILATING AND AIR  
CONDITIONING (HVAC) BASIC  
REQUIREMENTS

1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces in mechanical rooms, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
2. After acceptance by Authority Having Jurisdiction (AHJ), In a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
3. See individual equipment Specifications for other painting.
4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
5. Piping and Ductwork: Clean, primer coat and paint exposed piping and ductwork on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
6. Covers: Covers such as manholes, cleanouts and the like will be furnished with finishes which resist corrosion and rust.

### 3.12 ACCESS PANELS

- A. Confirm Access Panel requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
  1. Coordinate locations/sizes of access panels with Architect prior to work.

### 3.13 DEMOLITION

- A. Confirm requirements in Division 01, General Requirements and Division 02, Existing Conditions. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
  1. Scope:
    - a. It is the intent of these documents to provide necessary information and adjustments to the HVAC 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 utilities. Replace damaged items with new material to match existing. Promptly notify Owner if utilities are found which are not shown on Drawings.

2. Equipment: Unless otherwise directed, equipment, fixtures, or fittings being removed as part of demolition process are Owner's property. Remove other items not scheduled to be reused or relocated from job site as directed by Owner.
3. Unless specifically indicated on Drawings, remove exposed, unused ductwork and piping to behind finished surfaces (floor, walls, ceilings, etc.). Cap and patch surfaces to match surrounding finish.
4. Unless specifically indicated on Drawings, remove unused equipment, fixtures, fittings, rough-ins, and connectors. Removal is to be to a point behind finished surfaces (floors, walls, and ceilings).

### 3.14 ACCEPTANCE

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections 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 and Balancing Reports
    - 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
    - h. Commissioning Reports

### 3.15 FIELD QUALITY CONTROL

- A. Confirm Field Quality Control requirements in Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.
- B. Tests:
  1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in Operation and Maintenance Manuals.

2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

### 3.16 LETTER OF CONFORMANCE

- A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that HVAC 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.

### 3.17 ELECTRICAL INTERLOCKS

- A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

### 3.18 TEMPORARY HEATING, COOLING AND HUMIDITY CONTROL

- A. Provide temporary heating, cooling, controls, humidification and dehumidification as required to facilitate the construction of the project. Size and select temporary system based on the requirements of the various trades during construction. This includes, but is not limited to, drywall, case work, wood flooring and wood finishes that are subject to warping. Size and install system to prevent mold growth. Coordinate the location of the temporary system. The house system can be used. Develop a procedure for how the house system will be used including a sketch depicting the house system, how filtration will be used to prevent construction debris from entering the system and how often the filters will be changed, how the ductwork will be cleaned after use to ensure a clean system is turned over to the Owner and how the units are sized. Submit this procedure to the Mechanical Engineer for review. Follow National Air Duct Cleaners Association (NADCA) duct cleaning procedures and guidelines. Warranties for the house system, if new, to commence when the Owner moves in if house system is used as the means to maintain the climate within the building during construction. Include this warranty requirement in the original bid or proposal amount. Coordinate and provide any temporary power, controls, ductwork, piping, plumbing anchorage, miscellaneous steel and structural supports required to support the temporary system. Installation of the system to comply with all applicable codes and be acceptable to the Authority Having Jurisdiction (AHJ).

### **END OF SECTION**

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**SECTION 23 05 29**

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**HANGERS AND SUPPORTS FOR HVAC PIPING, DUCTWORK AND EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Hangers and Supports for HVAC Piping, Ductwork and Equipment
2. Wall and Floor Sleeves
3. Building Attachments
4. Flashing
5. Miscellaneous Metal and Materials

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
1. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.
  2. Terminology: As defined in MSS SP-90 "Guidelines on Terminology for Pipe Hangers and Supports".
  3. Install ductwork and piping per SMACNA's requirements.
  4. Hanger spacing installation and attachment to meet all manufacturer's requirements and MSS SP-58.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.



## 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Welding:
    - a. Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications".
  - 2. Welding for Hangers:
    - a. Qualify procedures and personnel according to AWS D9.1, Sheet Metal Welding Code for duct joint and seam welding.
  - 3. Engineering Responsibility:
    - a. Design and preparation of Shop Drawings and calculations for each multiple pipe support, trapeze, duct support equipment hangers/supports, and seismic restraint by a qualified Structural Professional Engineer.
      - 1) Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of hangers and supports that are similar to those indicated for this Project in material, design, and extent.
  - 4. Manufacturers regularly engaged in the manufacture of bolted metal framing support systems, whose products have been in satisfactory use in similar service for not less than 10 years.
  - 5. Support systems to be supplied by a single manufacturer.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

## 1.7 PERFORMANCE REQUIREMENTS

- A. Provide pipe, ductwork and equipment hangers and supports in accordance with the following:
  - 1. When supports, anchorages, and seismic restraints for equipment, and supports, anchorages, and seismic restraints for conduit, piping, and ductwork are not shown on the Drawings, the contractor is responsible for their design.



2. Connections to structural framing not to introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.
- B. Engineered Support Systems:
  1. Support frames such as pipe racks or stanchions for piping, ductwork, and equipment which provide support from below.
  2. Equipment, ductwork and piping support frame anchorage to supporting slab or structure.
- C. Provide channel support systems, for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- D. Provide heavy-duty steel trapezes for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- E. Provide seismic restraint hangers and supports for piping, ductwork and equipment. See Section 23 05 48.
- F. Obtain approval from AHJ for seismic restraint hanger and support system to be installed for piping and equipment. See Section 23 05 48.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Hangers and Supports for HVAC Piping, Ductwork and Equipment:
  1. Anvil International
  2. B-Line Systems, Incorporated
  3. Erico Company, Incorporated
  4. Nelson-Olsen Incorporated
  5. Rilco Manufacturing Company, Incorporated
  6. Snappitz Thermal Pipe Shield Manufacturing
  7. Unistrut Corporation
  8. Or approved equivalent.
- B. Wall and Floor Sleeves:
  1. Thunderline Corporation "Link Seal".
  2. Or approved equivalent.

C. Building Attachments:

1. Anchor-It
2. Gunnebo Fastening Corporation
3. Hilti Corporation
4. ITW Ramset/Red Head
5. Masterset Fastening Systems, Incorporated
6. Or approved equivalent.

D. Flashing:

1. Manufacturer not applicable.

E. Miscellaneous Metal and Materials:

1. Manufacturer not applicable.

2.2 HANGERS AND SUPPORTS FOR HVAC PIPING, DUCTWORK AND EQUIPMENT

- A. Hanger Rods: Hanger rods continuously threaded or threaded ends only in concealed spaces and threaded ends only in exposed spaces; finish electro-galvanized or cadmium-plated in concealed spaces and prime painted in exposed spaces; sizes per MSS.
- B. Hanger Rod Couplings: Anvil Figure 136, B-Line Figure B3220, or approved equivalent; malleable iron rod coupling with elongated center sight gap for visual inspection; to have same finish as hanger rods.
- C. Channel Hanging System:
1. Framing members No. 12 gauge formed steel channels, 1-5/8-inch square, conforming to ASTM A570 GR33, one side of channel to have a continuous slot within turned lips; framing nut with grooves and spring 1/2-inch size, conforming to ASTM 675 GR60; screws conforming to ASTM A307; fittings conforming to ASTM A575; parts enamel painted or electro-galvanized.
  2. Concrete Inserts: Malleable iron body, hot tipped galvanized finish. Lateral adjustment. MSS Type 18.
- D. Continuous Concrete Insert: Steel construction, minimum 12 gauge. Electrogalvanized finish. Pipe clamps and insert nuts to match.
- E. Pipe Hangers:
1. Pipe Rings for Hanger Rods:

- a. Pipe Sizes 2-inches and Smaller: Adjustable swivel ring hanger, UL listed. Erico 100 or 101, Anvil Figures 69 or 104, or approved equivalent.
  - b. Pipe Sizes 2-1/2-inches and Larger: Clevis type hangers with adjustable nuts on rod, UL listed. Anvil figure 260, Erico 400, or approved equivalent.
  - c. Pipe hangers to have same finish as hanger rods.
- F. Pipe Saddles and Shields:
- 1. Factory fabricated saddles or shields under piping hangers and supports for insulated piping.
  - 2. Size saddles and shields for exact fit to mate with pipe insulation. 1/2 round, 18 gauge, minimum 12-inches in length (4-inch pipe and larger to be three times longer than pipe diameter).
- G. Riser Clamps: Steel, UL listed. MSS Type 8. Erico 510 or 511. Copper coated; Erico 368.
- H. Pipe Slides: Anvil, reinforced Teflon slide material (3/32-inch minimum thickness) bonded to steel; highly finished steel or stainless steel contact surfaces to resist corrosion; 60-80 PSI maximum active contact surface loading; steel parts 3/16-inch minimum thickness; attachment to pipe and framing by welding.
- I. Pipe Guides:
- 1. Furnish and install pipe guides on continuous runs where pipe alignment must be maintained. Minimum two on each side of expansion joints, spaced per manufacturer's recommendations for pipe size. Fasten guides securely to pipe and structure. Contact with chilled water pipe not to permit heat to be transferred in sufficient quantity to cause condensation on any surface.
  - 2. Furnish and install guides approximately four pipe diameters (first guide) and 14 diameters (second guide) away from each end of expansion joints. Guides are not to be used as supports and are in addition to other pipe hangers and supports.
- J. Pipe Roller Hangers: Adjustable roller hanger. Black steel yoke, cast iron roller. MSS Type 41.
- K. Thermal Hanger Shield Inserts:
- 1. 100-PSI (690-kPa) minimum compressive strength calcium silicate insulation, encased in sheet metal shield or polyisocyanurate rigid foam exceeding the load bearing weight of the pipe at the hanger point with a PVC vapor barrier.
  - 2. Material for Cold Piping: Water-repellent-treated, ASTM C533, Type I calcium silicate with vapor barrier or polyisocyanurate rigid foam with a PVC vapor barrier.

3. Material for Hot Piping: Water-repellent-treated ASTM C533, Type 1 calcium silicate or polyisocyanurate rigid foam with a PVC vapor barrier.
  4. For Trapeze or Clamped System: Insert and shield cover entire circumference of pipe.
  5. For Clevis or Band Hanger: Insert and shield cover lower 180 degrees of pipe.
  6. Insert Length: Extend 2-inches beyond sheet metal shield for piping operating below ambient air temperature.
  7. Thermal Hanger Shield Insulation Operating Temperature: Meet or exceed fluid temperature in pipe.
- L. Freestanding Roof Supports: Polyethylene high-density UV resistant quick "pipe" block with foam pad.

## 2.3 WALL AND FLOOR SLEEVES

- A. Pre-Engineered Firestop Pipe Penetration Systems: UL listed assemblies for maintaining fire rating of piping penetrations through fire-rated assemblies. Comply with ASTM E814.
- B. Fabricated Accessories:
1. Steel Pipe Sleeves: Fabricate from Schedule 40 black or galvanized steel pipe. Remove end burrs by grinding.
  2. Sheet Metal Pipe Sleeves: Fabricate from G-90 galvanized sheets closed with lock-seam joints. Provide the following minimum gauges for the sizes indicated:
    - a. Sleeve Size 4-inches in Diameter and Smaller: 18 gauge.
    - b. Sleeve Sizes 5-6-inches: 16 gauge.
    - c. Sleeve Sizes 7-inches and Larger: 14 gauge.
    - d. Fire-Rated Safing Material.
      - 1) Rockwool Insulation: Complying with FS-HH-I-558, Form A, Class IV, 6 pounds per cubic foot density with melting point of 1985 degrees F and K value of 0.24 at 75 degrees F.
      - 2) Calcium Silicate Insulation: Noncombustible, complying with FS-HH-I-523, Type II, suitable for 100 degrees F to 1200 degrees F service with K value of 0.40 at 150 degrees F.

## 2.4 BUILDING ATTACHMENTS

- A. Beam Clamps:

1. MSS Type 19 and 23, wide throat, with retaining clip.
2. Universal Side Beam Clamp: MSS Type 20.
- B. Powder-Actuated Drive Pin Fasteners: Powder actuated type, drive pin attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
- C. Anchor Bolts:
  1. Anchor supports to existing masonry, block and tile walls per anchoring system manufacturer's recommendations or as modified by project structural engineer. Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
  2. Anchor Bolts (Cast-In-Place): Steel bolts, ASTM A307. Nuts to conform to ASTM A194. Design values for shear and tension not more than 80 percent of the allowable listed loads.
  3. Anchor (Expansion) Bolts: Carbon steel to ASTM A307; nut to conform to ASTM A194; drilled-in type. Design values for shear and tension not more than 80 percent of the allowable listed loads.
  4. Anchor (Adhesive) Bolts: Consisting of two-part adhesive cartridge and zinc-plated Type A307 steel anchor bolt rod assembly with ASTM A194 nut.

## 2.5 FLASHING

- A. Steel Flashing: 26 gauge galvanized steel.
- B. Safes: 8 mil thick neoprene.
- C. Caps: Steel, 22 gauge minimum, 16 gauge at fire-resistant structures.

## 2.6 MISCELLANEOUS METAL AND MATERIALS

- A. General:
  1. Provide miscellaneous metal items specified, including materials, fabrication, fastenings and accessories required for finished installation, where indicated on drawings or otherwise not shown on drawings that are necessary for completion of the project. Contractor is responsible for their design.
  2. Fabricate miscellaneous units to size shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

- B. Structural Shapes: Where miscellaneous metal items are needed to be fabricated from structural steel shapes and plates, provide members constructed of steel conforming with requirements of ASTM A36 or approved equivalent.
- C. Steel Pipe: Provide seamless steel pipe conforming to requirements of ASTM A53, Type S, Grade A, or Grade B. Weight and size required as specified.
- D. Fasteners: Provide fasteners of types as required for assembly and installation of fabricated items; surface-applied fasteners are specified elsewhere.
- E. Bolts: Low carbon steel externally and internally threaded fasteners conforming with requirements of ASTM A307; include necessary nuts and plain hardened washers. For structural steel elements supporting mechanical material or equipment from building structural members or connection thereto, use fasteners conforming to ASTM A325.
- F. Miscellaneous Materials: Provide incidental accessory materials, tools, methods, and equipment required for fabrication.
- G. Provide hot dipped galvanized components for items exposed to weather. Use materials compatible with system being supported (i.e. aluminum for aluminum ductwork, stainless steel for stainless steel ductwork).
- H. Use straps, threshold rods and wire with sizes required by SMACNA to support ductwork.
- I. Grout:
  - 1. ASTM C1107, Grade B, factory mixed and packaged, nonshrink and nonmetallic, dry, hydraulic-cement grout.
  - 2. Characteristics: Post hardening and volume adjusting; recommended for both interior and exterior applications.
  - 3. Properties: Nonstaining, noncorrosive, and non gaseous.
  - 4. Design Mix: 5000-PSI (34.5-MPa), 28-day compressive strength.

## **PART 3 - EXECUTION**

### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Verify building materials to have hangers and attachments affixed in accordance with hangers to be used. Provide supporting calculations.
- B. Examine Drawings and coordinate for verification of exact locations of fire and smoke rated walls, partitions, floors and other assemblies. Indicate, by shading and labeling on Record Drawings such locations and label as "1-Hour Wall", "2-Hour Fire/Smoke Barrier", and the like. Determine proper locations for piping penetrations. Set sleeves in place in new floors, walls or roofs prior to concrete pour or grouting.

- C. Install hangers, supports, anchors and sleeves after required building structural work has been completed in areas where the work is to be installed. Coordinate proper placement of inserts, anchors and other building structural attachments.
- D. Equipment Clearances: Do not route ductwork, equipment, or piping through electrical rooms, transformer vaults, elevator equipment rooms, IT rooms, MPOE rooms, or other electrical or electronic equipment spaces and enclosures and the like. Within equipment rooms, provide minimum 3-foot lateral clearance from all sides of electric switchgear panels. Do not route ductwork, equipment, or piping above any electric power or lighting panel, switchgear, or similar electric device. Coordinate with Electrical and coordinate exact ductwork, equipment or pipe routing to provide proper clearance with such items.

### 3.2 HANGERS AND SUPPORTS FOR HVAC PIPING, DUCTWORK AND EQUIPMENT

- A. Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 SF with galvanized strips of No. 16 USS gauge steel 1-inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at a maximum of 8-feet on center.
- B. Support horizontal ducts within 24-inches of each elbow and within 48-inches of each branch intersection.
- C. Provide aluminum supports for aluminum ductwork.
- D. Provide stainless steel supports for stainless steel ductwork.
- E. Support vertical ducts at maximum intervals of 16-feet and at each floor.
- F. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.
- G. Use double nuts and lock washers on threaded rod supports.
- H. Floor supports in mechanical rooms to be elevated 1-inch above finish floor and void space filled with masonry grout.
- I. Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure. Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts, piping or equipment.
- J. Attach strap hangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.
- K. Construct exterior ductwork or ductwork which is otherwise exposed to weather watertight and slope 1/4-inch per foot to avoid standing water.
- L. Channel Support System Installation:
  - 1. Arrange for grouping of parallel runs of piping and support together on field-assembled channel systems.

2. Field assemble and install according to manufacturer's written instructions.
- M. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- N. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- O. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- P. Adjust hangers so as to distribute loads equally on attachments. Provide grout under supports to bring piping, ductwork and equipment to proper level and elevations.
- Q. Prime paint ferrous nongalvanized hangers, accessories, and supplementary steel which are not factory painted.
- R. Horizontal Piping Hangers and Supports; Horizontal and Vertical Piping, and Hanger Rod Attachments:
  1. Factory fabricated horizontal piping hangers and supports complying with MSS SP-58, to suit piping systems and in accordance with manufacturer's published product information.
  2. Use only one type by one manufacturer for each piping service.
  3. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping.
  4. Pipe support spacing (pipe supported in ceiling or floor-supported) to meet latest applicable Code and manufacturer's requirements.
  5. Provide copper-plated hangers and supports for uninsulated copper piping systems.
- S. Plumber's Tape not permitted as pipe hangers or pipe straps.
- T. Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure. For horizontally hung grooved-end piping, provide a minimum of 2 hangers per pipe section.
- U. Pipe Ring Diameters:
  1. Uninsulated and Insulated Pipe, Except Where Oversized Pipe Rings are Specified: Ring inner diameter to suit pipe outer diameter.
  2. Insulated Piping Where Oversized Pipe Rings are Specified and Vibration Isolating Sleeves: Ring inner diameter to suit outer diameter of insulation or sleeve.



- V. Oversize Pipe Rings: Provide oversize pipe rings of 2-inch and larger size.
- W. Pipe Support Brackets: Support pipe with pipe slides.
- X. Steel Backing in Walls: Provide steel backing in walls to support fixtures and piping hung from steel stud walls.
- Y. Heavy-Duty Steel Trapeze Installation:
  - 1. Arrange for grouping of parallel runs of horizontal piping and support together on field fabricated, heavy-duty trapezes.
  - 2. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
  - 3. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D-1.1.
- Z. Group parallel runs of horizontal piping to be supported together on trapeze-type hangers. Maximum spacings: MSS SP-58.
- AA. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe.
- AB. Do not support piping from other piping.
- AC. Fire protection piping will be supported independently of other piping.
- AD. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.
- AE. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping" is not exceeded.
- AF. Insulated Piping:
  - 1. Attach clamps and spacers to piping.
  - 2. Piping Operating Above Ambient Air Temperature: Clamp may project through insulation.
  - 3. Piping Operating Below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
  - 4. Do not exceed pipe stress limits according to ASME B31.9.
  - 5. Install MSS SP-58, Type 39 protection saddles, if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

6. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.
7. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields to span arc of 180 degrees.
8. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.
9. Shield Dimensions for Pipe, not less than the following:
10. NPS 1/4 to NPS 3-1/2 (DN8 to DN 90): 12-inches long and 0.048-inch thick.
11. NPS 4 (DN100): 12-inches long and 0.06-inch thick.
12. NPS 5 and NPS 6 (DN125 and DN150): 18-inches long and 0.06-inch thick.
13. NPS 8 to NPS 14 (DN200 to DN350): 24-inches long and 0.075-inch thick.
14. NPS 16 to NPS 24 (DN400 to DN600): 24-inches long and 0.105-inch thick.
15. Pipes NPS 8 (DN200) and Larger: Include wood inserts.
16. Insert Material: Length at least as long as protective shield.
17. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

AG. Pipe Anchors: Provide anchors to fasten piping which is subject to expansion and contraction, and adjacent to equipment to prevent loading high forces onto the equipment.

AH. Pipe Curb Assemblies:

1. Provide prefabricated units for roof membrane and insulation penetrations related to equipment. Coordinate with roofing system. Set supports on the structural deck. Do not set supports on insulation or roofing. Provide level supports by prefabricated pitch built into the curb.
2. Provide for piping and electrical conduit which penetrates the structural roof deck to service equipment above the roof level (i.e., piping, electrical power and control wiring). Meet requirements of roof warranty.

AI. Escutcheon Plates: Install around horizontal and vertical piping at visible penetrations through walls, partitions, floors, or ceilings, including penetrations through closets, through below ceiling corridor walls, and through equipment room walls and floors.

AJ. Vertical Piping:

1. Support with U-clamps fastened to wall to hold piping away from wall unless otherwise approved.

2. Riser clamps to be directly under fitting or welded to pipe.
  - a. Riser to be supported at each floor of penetration.
  - b. Provide structural steel supports at the base of pipe risers. Size supports to carry forces exerted by piping system when in operation.

AK. Piping above roof to be supported with freestanding roof pipe supports unless detailed otherwise.

### 3.3 WALL AND FLOOR SLEEVES

- A. "Link-Seal" Pipe Sleeves: Install at floor/below grade piping penetrations. Provide manufacturer's sleeve appropriate to seal type for pre-cast penetrations.
- B. Fabricated Pipe Sleeves:
  1. Provide either steel or sheet metal pipe sleeves accurately centered around pipe routes. Size such that piping and insulation, if any, will have free movement within the sleeve, including allowance for thermal expansion. Sleeve diameter to be determined by local seismic clearance requirements, and by waterproofing requirements.
  2. Length: Equal to thickness of construction penetrated, except extend floor sleeves 1-inch above floor finish.
  3. Provide temporary support of sleeves during placement in concrete and other work around sleeves. Provide temporary end closures to prevent concrete and other materials from entering pipe sleeves.
  4. Seal each end airtight with a resilient nonhardening sealer, UL listed, fire rated ASTM 814.
- C. Installation of metallic or plastic piping penetrations through non fire-rated walls and partitions and through smoke-rated walls and partitions:
  1. Install fabricated pipe sleeve.
  2. After installation of sleeve and piping, tightly pack entire annular void between piping or piping insulation and sleeve identification with specified material.
  3. Seal each end airtight with a resilient nonhardening UL listed fire resistant ASTM 814.
- D. Piping Penetrations Through Fire-Rated (One to Three Hour) Assemblies:
  1. Select and install pre-engineered pipe penetration system in accordance with the UL listing and manufacturer's recommendation.

2. 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.

### 3.4 BUILDING ATTACHMENTS

- A. Factory fabricated attachments complying with MSS SP-58, selected to suit building substructure conditions and in accordance manufacturer's published product information.
- B. Select size of building attachments to suit hanger rods.
- C. Install concrete inserts before placing concrete.
- D. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
- E. Do not use powder-actuated concrete fasteners for lightweight aggregate concretes or for slabs less than 4-inches thick.
- F. Install within concrete or on structural steel or wood. Attachment to wood structure: Anvil side beam bracket Figure 202 for attachment to wooden beam or approved attachment for a wood structure.
- G. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping.
- H. Install concrete inserts before concrete is placed; fasten insert secure to forms. Where concrete with compressive strength less than 2500 PSI is indicated, install reinforcing bars through openings at top in inserts.
- I. Install building attachments within concrete slabs or attach to structural steel. Space attachments within maximum piping span length indicated in MSS SP-58. Install additional attachments at concentrated loads, including valves, flanges guides, strainers, and expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- J. Install powder-actuated drive-pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
- K. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- L. Bolting: Provide bored, drilled or reamed holes for bolting to miscellaneous structural metals, frames or for mounts or supports. Flame cut, punched or hand sawn holes will not be accepted.

M. Anchor Bolts:

1. Install anchor bolts for mechanical equipment, piping and ductwork as required. Tightly fit and clamp base-supported equipment anchor bolts at equipment support points. Provide locknuts where equipment, piping and ductwork are hung.
2. Anchor bolts (Cast-In-Place): Embed anchor bolts in new cast-in-place concrete to anchor equipment. Install a pipe sleeve around the anchor bolt for adjustment of the top 1/3 of the bolt embedment; sizes and patterns to suit the installation conditions of the equipment to be anchored.

N. Testing: Test powder-actuated insert attachments with a minimum load of 100 pounds.

3.5 FLASHING

- A. Flash and counterflash where piping, ductwork and equipment passes through weather or waterproofed walls, floors, and roofs.
- B. Provide 12-inches minimum height curbs for roof-mounted mechanical equipment. Flash and counter flash with galvanized steel, soldered and waterproofed.

3.6 MISCELLANEOUS METAL AND MATERIALS

- A. General: Verify dimensions prior to fabrication. Form metal items to accurate sizes and configurations as indicated on drawings and otherwise required for proper installation; make with lines straight and angles sharp, clean and true; drill, countersink, tap, and otherwise prepare items for connections with work of other trades, as required. Fabricate to detail of structural shapes, plates and bars; weld joints where practicable; provide bolts and other connection devices required. Include anchorages; clip angles, sleeves, anchor plates, and similar devices. Hot dipped galvanize after fabrication items installed in exterior locations. Set accurately in position as required and anchor securely to building construction. Construct items with joints formed for strength and rigidity, accurately machining for proper fit; where exposed to weather, form to exclude water.
- B. Finishes:
  1. Ferrous Metal: After fabrication, but before erection, clean surfaces by mechanical or chemical methods to remove rust, scale, oil, corrosion, or other substances detrimental to bonding of subsequently applied protective coatings. For metal items exposed to weather or moisture, galvanize in manner to obtain G90 zinc coating in accordance with ASTM A123. Provide other non-galvanized ferrous metal with 1 coat of approved rust-resisting paint primer, in manner to obtain not less than 1.0 mil dry film thickness. Touch-up damaged areas in primer with same material, before installation. Apply zinc coatings and paint primers uniformly and smoothly; leave ready for finish painting as specified elsewhere.

2. Metal in Contact with Concrete, Masonry and Other Dissimilar Materials: Where metal items are to be erected in contact with dissimilar materials, provide contact surfaces with coating of an approved zinc-chromate primer in manner to obtain not less than 1.0 mil dry film thickness, in addition to other coatings specified in these specifications.
  3. For Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A780.
- C. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.
  - D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required. Avoid cutting concrete reinforcing when drilling for inserts. Reference structural drawings and reinforcing shop drawings and determine locations of stirrups prior to drilling into concrete.
  - E. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items, which are to be built into concrete masonry or similar construction.
  - F. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
  - G. Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
  - H. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.
  - I. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
  - J. Cut, drill, and fit miscellaneous metal fabrications for heavy-duty steel trapezes and equipment supports.

- K. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.
- L. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.
- M. Provide galvanized components for items exposed to weather.

**END OF SECTION**

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**SECTION 23 05 48**

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**VIBRATION AND SEISMIC CONTROLS FOR HVAC EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

**A. Work Included:**

1. Vibration Isolation
2. Seismic Restraint Devices
3. Factory Finishes
4. Seismic-Bracing/Restraint Devices/Systems for Equipment, Piping and Ductwork

**B. General:**

1. Vibration isolation for mechanical ductwork, piping and equipment.
2. Seismic restraint for mechanical ductwork, piping and equipment.
3. Seismic Certification for equipment, hangers and systems
4. Special inspections for systems.

**C. Scope of Work:**

1. Vibration isolation and seismic restraint of new equipment and systems within project boundary defined in architectural drawings.
2. Vibration isolation and seismic restraint of new equipment and systems in existing buildings to points of connection with existing systems.

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.



B. In addition, provide:

1. Vibration Isolation:

- a. Product Data: Provide catalog data indicating size, type, load and deflection of each isolator; and percent of vibration transmitted based on lowest disturbing frequency of equipment.
- b. Shop Drawings: Showing complete details of construction for steel and concrete bases including:
  - 1) Fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment and cantilever loads.
  - 2) Equipment mounting holes.
  - 3) Dimensions.
  - 4) Size and location of concrete and steel bases and curbs.
  - 5) Isolation selected for each support point.
  - 6) Details of mounting brackets for isolator.
  - 7) Weight distribution for each isolator.
  - 8) Details of seismic snubbers.
  - 9) Code number assigned to each isolator.
- c. Design calculations: Provide calculations for selecting vibration isolators and for designing vibration isolation bases.

2. Seismic Restraint:

- a. Shop Drawings: Show compliance with requirements of Quality Assurance article of this Section. Shop drawings to be stamped by a professional Structural Engineer licensed in State of California.
- b. Calculations: Submit seismic calculations indicating restraint loadings resulting from design seismic forces. Include anchorage details and indicate quantity, diameter and depth of penetration of anchors. Calculations certified by professional Structural Engineer licensed in State of California.

3. Seismic Restraint Details: Detail fabrication and attachment of seismic restraints and snubbers. Show anchorage details and indicate quantity, diameter and depth of penetration of anchors.

4. Submittals for Interlocking Snubbers: Include load deflection curves up to 1/2-inch deflection in x, y and z planes.
5. Welding certificates.
6. Equipment Certification: Provide seismic certification for equipment as noted in Seismic Design Summary or schedules on Drawings.

## 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  1. Vibration Isolation:
    - a. Except for packaged equipment with integral isolators, single manufacturer selects and furnishes isolation required.
    - b. Deflections indicated on drawings are minimum actual static deflections for specific equipment supported.
    - c. Isolator Stability:
      - 1) Size springs of sufficient diameter to maintain stability of equipment being supported. Spring diameters not less than 0.8 of compressed height at rated load.
      - 2) Springs have minimum additional travel to solid equal to 50 percent of rated deflection.
      - 3) Springs support 200 percent of rated load, fully compressed, without deformation or failure.
    - d. Maximum Allowable Vibration Levels: Peak vibration velocities not exceed 0.08 in/sec. Correct equipment operating at vibration velocities that exceed this criteria.
  2. Seismic Restraint:
    - a. Code and Standard Requirements:
      - 1) Seismic restraint of equipment, piping and ductwork to be in accordance with latest enacted version of CBC Chapter 16.
    - b. Confirm Seismic Control requirements in Division 01, General Requirements and Structural documents.
    - c. Certification: See Seismic Design Table or schedules on Drawings for equipment, systems and seismic-restraint devices designated to have

seismic certification/qualification. Horizontal and vertical load testing and analysis performed according to ASCE 7-10. Anchorage systems to bear anchorage preapproval number from an agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing or calculations, if preapproved ratings are not available. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be sealed by qualified licensed professional engineer in State of California. Testing and calculations must include both shear and tensile loads and one test or analysis at 45 degrees to weakest mode.

- d. Seismic restraint and anchorage of permanent equipment and associated systems listed below to building structure be designed to resist total design seismic force prescribed in local building code:
  - 1) Floor- or roof-mounted equipment weighing 400 pounds or greater.
  - 2) Suspended, wall-mounted or vibration isolated equipment weighing 20 pounds or greater.
  - 3) In-line duct devices connected to ductwork weighing 75 pounds or greater.
  - 4) Housekeeping slabs: provide reinforcement and anchorage to building structure.
- e. Where required, seismic sway bracing of suspended duct and piping meet following:
  - 1) Pipe and duct runs requiring seismic bracing have minimum of two traverse braces and one longitudinal brace. Longitudinal (or traverse) brace at 90 degree change in direction may act as traverse (or longitudinal) brace if located within 2-feet of change in direction.
  - 2) Seismic bracing may not pass through seismic separation joint. Pipe or duct runs that pass through seismic separation joint must be restrained within 5-feet of both sides of separation.
  - 3) Seismic brace assembly spacing not to exceed 40-feet transverse and 80-feet longitudinal.
- f. Seismic restraints may be omitted from suspended piping and duct if following conditions are satisfied:
  - 1) For piping or ducts supported by rod hangers 12-inches or less in length from top of duct to bottom of structural support. Top connections to structure have swivel joints, eye bolts, or vibration isolation hangers for entire length of system run.

- 2) Lateral motion of system will not cause damaging impact with surrounding systems or cause loss of system vertical support.
  - 3) System must be welded steel pipe, brazed copper pipe, sheet metal duct or similar ductile material with ductile connections.
- C. Seismic restraints, including anchors to building structure, be designed by registered professional Structural or Civil Engineer licensed in State of California. Design includes:
1. Number, size, capacity and location of anchors for floor- or roof-mounted equipment. For curb-mounted equipment, provide design of attachment of both unit to curb and curb to structure.
  2. Number, size, capacity and location of seismic restraint devices and anchors for vibration-isolation and suspended equipment. Provide calculations and test data verifying horizontal and vertical ratings of seismic restraint devices.
  3. Number, size, capacity and location of braces and anchors for suspended piping and ductwork on as-built plan drawings.
  4. Maximum seismic loads to be indicated on drawings at each brace location. Drawings bear stamp and signature of registered professional Structural or Civil Engineer who designed layout of braces.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

#### 1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Seismic Snubber Units: Furnish replacement neoprene inserts for snubbers.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Vibration Isolation:
1. The VMC Group
  2. B-Line Systems, Inc.
  3. Kinetics Noise Control, Inc.
  4. Mason Industries Inc.

5. M.W. Sausse - Vibrex
  6. Where Mason numbers are specified, equivalent products by listed manufacturers are acceptable.
  7. Or approved equivalent.
- B. Seismic Restraint Devices:
1. The VMC Group
  2. B-Line Systems, Inc.
  3. Hilti, Inc.
  4. Kinetics Noise Control, Inc.
  5. Mason Industries, Inc.
  6. California Dynamics Corporation
  7. Cooper B-Line Tolco.
  8. Unistrut Diversified Products Co.; Wayne Manufacturing Division.
  9. M.W. Sausse - Vibrex
  10. Or approved equivalent.
- C. Factory Finishes:
1. Kynar 500 Fluoropolymer Coating
  2. Or approved equivalent.
- D. Seismic-Bracing/Restraint Devices/Systems for Equipment, Piping and Ductwork:
1. The VMC Group
  2. California Dynamics Corporation
  3. Cooper B-Line, Inc.
  4. Hilti, Inc.
  5. Mason Industries, Inc.
  6. Kinetics Noise Control.
  7. Unistrut
  8. ISAT, Inc.

9. Where Mason numbers are specified, equivalent products by listed manufacturers are acceptable.
10. Or approved equivalent.

## 2.2 VIBRATION ISOLATION

- A. Type 1 - Neoprene Pad: Natural rubber waffle pads, arranged in single or multiple layers, 3/4-inch thick per layer with pattern repeating on 1/2-inch centers; 50 durometer hardness; maximum loading 60 PSI. 1/4-inch thick steel load distribution plate between layers and between pad and equipment, factory cut to sizes matching requirements of supported equipment. Molded bridge with neoprene anchor bolt bushing and flat washer face to prevent metal to metal contact. Number of layers required for equipment scheduled. Mason Type: Super WMH.
- B. Type 2 - Neoprene Mount: Double-deflection type, with ductile-iron housing containing two separate and opposing, oil-resistant natural rubber or bridge bearing neoprene elements, factory-drilled, encapsulated top plate for bolting to equipment and with baseplate for bolting to structure. Neoprene elements to prevent metal to metal contact during normal operation. Minimum static deflection of 0.20-inches. Mason Type: BR.

## 2.3 SEISMIC RESTRAINT DEVICES

- A. Resilient Isolation Washers and Bushings: 1-piece, molded, bridge-bearing neoprene complying with AASHTO M 251 and having a durometer of 50, plus or minus 5, with a flat washer face.
- B. Restraining Cables: Galvanized steel aircraft cables with end connections made of steel assemblies that swivel to final installation angle and utilize two clamping bolts for cable engagement. Mason Type: SCB.
- C. Anchor Bolts: Seismic-rated, drill-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488/E 488M.

## 2.4 FACTORY FINISHES

- A. Provide manufacturer's standard prime-coat finish ready for field painting. Units mounted outdoors exposed to weather: Epoxy powder coated, with 1000 hour salt spray rating per ASTM B-117. For high levels of corrosion protection utilize:
  1. Conform to AAMA 605.2.
  2. Apply coating following cleaning and pretreatment.
  3. Cleaning: AA-C12C42R1X.
  4. Dry system before final finish application.

5. Total Dry Film Thickness: Approximately 1.2 mils, when baked at 450 degrees F for 10 minutes.

B. Finish:

1. Manufacturer's standard paint applied to factory-assembled and factory-tested equipment before shipping.
2. Powder coating on springs and housings.
3. Hardware be electrogalvanized. Hot-dip galvanize metal components for exterior use.
4. Baked enamel for metal components on isolators for interior use.
5. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

2.5 SEISMIC-BRACING/RESTRAINT DEVICES/SYSTEMS FOR EQUIPMENT, PIPING AND DUCTWORK

- A. General Requirements for Restraint Components: Rated strengths, features and applications to be as defined in reports by agency acceptable to authorities having jurisdiction.
- B. Structural Safety Factor: Allowable strength in tension, shear and pullout force of components be at least four times maximum seismic forces to which they will be subjected.
- C. Anchor bolts for attaching to concrete to be seismic-rated, drill-in and stud-wedge or female-wedge type.
- D. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
- E. Maximum 1/4-inch air gap and minimum 1/4-inch thick resilient cushion.

**PART 3 - EXECUTION**

3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Provide mounts for equipment installed outdoors for wind loads of 30 lbs. psf applied to any exposed surface of isolated equipment.
- B. Do not install equipment or pipe which makes rigid contact with building slabs, beams, studs, walls, etc.
- C. Anchor baseplate to floor or structure. Provide rubber grommets and washers to isolate bolt from base plate. Under no circumstances is isolation efficiency to be destroyed when bolting isolators to floor.

- D. Building Penetrations: Isolate water piping and ductwork penetrating wall, ceilings, floors or shafts from structure by piping isolator or by 3/8-inch thick foamed rubber insulation. Install units flush with finished structure face, using one for each side as required. Cut units to length if longer than structure thickness. Caulk around pipe or duct at equipment room wall.
- E. Provide roof curbs, equipment supports and roof penetrations. Work to maintain roof warranty. Coordinate location, size, structural connections/requirements and flashing prior to installation.
- F. Install Type 6 horizontal thrust restraints at centerline of thrust, symmetrical on either side of equipment.
- G. Vibration isolators must not cause change of position of equipment or piping which would stress piping connections or misalignment shafts or bearings. Isolated equipment is to be level and in proper alignment with connecting ducts and pipes.
- H. Pipe Hangers in Equipment Rooms: Support water and gas piping connected to rotating equipment within equipment rooms on spring and neoprene hangers. The first three hangers from a piece of vibrating equipment are to have a minimum of 1/2 static deflection of equipment isolators. Other isolators should have a minimum of 1/4 static deflection of equipment isolators.
- I. Examination:
  - 1. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements, installation tolerances and other conditions affecting performance.
  - 2. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
  - 3. Proceed with installation only after unsatisfactory conditions have been corrected.
- J. Testing: Perform following field quality-control testing:
  - 1. Isolator seismic-restraint clearance.
  - 2. Isolator deflection.
  - 3. Snubber minimum clearances.
- K. Adjusting:
  - 1. Adjust snubbers according to manufacturer's written recommendations.
  - 2. Torque anchor bolts according to equipment manufacturer's written recommendations to resist seismic forces.



- L. Cleaning: After completing equipment installation, inspect vibration isolation and seismic-control devices. Remove paint splatters and other spots, dirt and debris.
- M. Demonstration: Engage factory-authorized service representative to train Owner's maintenance personnel to adjust, operate and maintain air-mounting systems. Reference Division 01, General Requirements.

### 3.2 VIBRATION ISOLATION

- A. Reference 3.01, General Installation Requirements.
- B. Install per manufacturer's instructions and recommendations.
- C. Vibration isolators must be installed in strict accordance with manufacturer's written instructions and certified submittal data.
- D. Install isolation as indicated on drawings by type and location and where indicated below.
- E. Equipment Vibration Isolation Schedule:

Equipment	Size	Vibration Isolator Type	Minimum Deflection (in)
Fan-coils, Unit Heaters, Fan-Powered Terminal Units	All	Type 5B, or 5C, FC-2	0.75
Condensing Units	0 to 4.5 tons	Type 1 or 2	0.2

- F. Adjusting:
  - 1. Adjust isolators after piping systems have been filled and equipment is at operating weight.
  - 2. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
  - 3. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop.

### 3.3 FACTORY FINISHES

- A. Reference 3.01, General Installation Requirements.
- B. Install per manufacturer's instructions and recommendations.
- C. Finishes to be factory-applied. No field patching or holidays allowed.

3.4 SEISMIC-BRACING/RESTRAINT DEVICES/SYSTEMS FOR EQUIPMENT, PIPING AND DUCTWORK

- A. Reference 3.01, General Installation Requirements.
- B. Install per manufacturer's instructions and recommendations.
- C. Adjust seismic restraints to permit free movement of equipment within normal mode of operation.

**END OF SECTION**

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**SECTION 23 05 53**

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**IDENTIFICATION FOR HVAC PIPING, DUCTWORK AND EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Plastic Nameplates
2. Tags

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.
  2. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices unless otherwise indicated.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 23, HVAC Sections. Where more than a single type is specified for application, provide single selection for each product category.
- B. Plastic Nameplates:
  - 1. Brady Corporation
  - 2. Brimar
  - 3. Champion America
  - 4. Craftmark
  - 5. Seton
  - 6. Or approved equivalent.
- C. Tags:
  - 1. Brady Corporation
  - 2. Brimar
  - 3. Champion America
  - 4. Craftmark
  - 5. Seton
  - 6. Or approved equivalent.

### **2.2 PLASTIC NAMEPLATES**

- A. Description: Engraving stock melamine plastic laminate in the size and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color), punched for mechanical fastening except where adhesive mounting is necessary because of substrate. Provide 1/8-inch thick material.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/2-inch.
  - 3. Background Color: Black.

4. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.
5. Access Panel Markers: Manufacturer's standard 1/16-inch thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve or devices/equipment. Include center hole to allow attachment.

## 2.3 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 2-inch diameter.
- B. Metal Tags: Polished Brass with stamped letters; tag size minimum 2-inch diameter with smooth edges.
- C. Valve designations to be coordinated with existing valve identifications to ensure no repetitive designations are utilized.
- D. Chart/Schedules: Valve Schedule Frames. For each page of a valve schedule, provide glazed display frame with removable mounting as appropriate for wall construction upon which frame is to be mounted. Provide frames of finished hardwood or extruded aluminum, with SSB-grade sheet glass.
- E. Valve Tag Fasteners: Solid brass chain (wire link or beaded type), or solid brass S-hooks.
- F. Warning Tags: Preprinted or partially preprinted, accident-prevention tags; of plasticized card stock with matte finish suitable for writing.
  1. Size: Approximately 4 by 7-inches.
  2. Fasteners: Brass grommet and wire.
  3. Nomenclature: Large-size primary caption such as DANGER, CAUTION, or DO NOT OPERATE.
  4. Color: Yellow background with black lettering.

## PART 3 - EXECUTION

### 3.1 GENERAL - INSTALLATION

- A. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates riveted to equipment body.
- B. Identify ductwork with plastic ductmarkers.
- C. Identify piping, concealed or exposed, with plastic pipe markers.

- D. Coordinate names, abbreviations and other designations used in mechanical identification work with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.
- E. Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (as examples: Chiller No. 3, Air Handling Unit No. 42, Standpipe F12, and the like).
- F. Degrease and clean surfaces to receive adhesive for identification materials.
- G. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.
- H. Coordinate with the facility maintenance personnel to ensure consistency with the existing tagging system.
- I. Install all products in accordance with manufacturer's instructions.
- J. Manual Balancing Dampers: Provide 12-inch long orange marker ribbon to end of balancing damper handle.

### 3.2 PLASTIC NAMEPLATES

- A. Install plastic nameplates with corrosive-resistant mechanical fasteners.
- B. Identify control panels and major control components outside panels with plastic nameplates riveted to equipment body.
- C. Identify thermostats with nameplates.

### 3.3 TAGS

- A. Use metal tags on piping 3/4-inch diameter and smaller.
- B. Tag balancing valves and major dampers with balanced GPM or CFM indicated after balancing is completed and accepted.
- C. Install tags with corrosion resistant chain.
- D. Small devices, such as in-line pumps, may be identified with tags.
- E. Identify valves in main and branch piping with metal tags. Indicate valve function and the normally open or closed positions on the valve tag.
- F. Identify air terminal units and radiator valves with numbered plastic tags.

- G. Tag automatic controls, instruments, and relays. Key to control schematic.
- H. Install valve schedule at each mechanical room.

**END OF SECTION**

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**SECTION 23 05 93**

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**TESTING, ADJUSTING, AND BALANCING FOR HVAC**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. General Requirements and Procedures
2. Fundamental Air Systems Balancing Procedures
3. Temperature Control Verification
4. Dual Duct Systems Additional Procedures
5. Variable Flow Hydronic Systems Additional Procedures
6. Pre-Balance Reporting
7. Final Reports:
  - a. Report Requirements
  - b. General Report Data
  - c. System Diagrams
  - d. Air Handling Units
  - e. Duct Traverses
  - f. Diffusers/Registers/Grilles
  - g. Instrument Calibration
8. Additional Tests

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.



#### 1.4 SUBMITTALS

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
  - 1. Quality-Assurance Submittals: Submit two copies of evidence that the Testing, Adjusting, and Balancing (TAB) Agent and this Project's TAB team members meet the qualifications specified in the "Quality Assurance" Article below.
  - 2. Pre-Construction Phase Report:
    - a. Provide a pre-construction phase TAB Plan at least two weeks prior to the commencement of TAB work. This report is to include:
      - 1) A complete set of report forms intended for use on the project, with data filled in except for the field readings. Forms to be Project-specific.
      - 2) Marked up shop drawings identifying all HVAC equipment to be balanced, and associated outlets and terminal devices.
      - 3) Identification of the type, manufacturer, and model of the actual instruments to be used, and clear indication of which instrument will be used to take each type of reading. Calibration certifications are to be included.
      - 4) A narrative of any project specific and/or non-standard TAB procedures to be used, and the equipment or systems they apply to.
  - 3. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit two copies of the Contract Documents review report as specified in Part 3 of this Section.
  - 4. Strategies and Procedures Plan: Submit two copies of the TAB strategies and step-by-step procedures as specified in Part 3 below. Include a complete set of report forms intended for use on this Project.
  - 5. Specify reports required because of editing procedures in Part 3 of this Section.
  - 6. Certified TAB Reports: Submit two copies of reports prepared, as specified in this Section, on approved forms certified by the TAB Agent.
  - 7. Sample Report Forms: Submit two sets of sample TAB report forms.
  - 8. Test Instrument Calibration: Submit proof of calibration within the last 6 months.
  - 9. Final Report.
  - 10. Provide additional submittals to commissioning authority as dictated in commissioning specifications.

## 1.5 QUALITY ASSURANCE

- A. Quality Assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Acceptable Manufacturers:
    - a. California:
      - 1) Raglen System Balance
      - 2) Pacific Test & Balance, Inc.
      - 3) Air Test & Balance, Inc.
      - 4) RSA Analysis, Inc.
      - 5) Air Balance Co. Inc.
      - 6) Total Air Balance Co. Inc.
      - 7) National Air Balance Company (NABCO)
      - 8) Mesa 3
  - 2. Acceptable Balance Firm:
    - a. General:
      - 1) Procure services of independent TAB agency to balance, adjust and test water circulating and air moving equipment and air distribution or exhaust systems. Minimum experience: 5 years.
    - b. Industry Standards: Testing and Balancing will conform to NEBB, American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), and American National Standards Institute (ANSI) as follows:
      - 1) NEBB: Comply with Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
      - 2) ASHRAE: Comply with recommendations pertaining to measurements, instruments, and TAB.
      - 3) ANSI:
        - a) S1.4 Specifications for sound level meters.
        - b) S1.11 Specifications for Octave-Band and Fractional-Octave-Band analog and digital filters.

- c) ANSI S1.13 Methods for the Measurement of Sound Pressure Levels.
- c. Test Observation: If requested, conduct tests in the presence of the Architect or the Architect's representative.
- 3. Provide proof of testing agency having successfully completed at least five projects of similar size and scope.
- 4. Code Compliance: Perform tests in the presence of the Authority Having Jurisdiction (AHJ) where required by the Authority Having Jurisdiction (AHJ).
- 5. Owner Witness: Perform tests in the presence of the Owners representative.
- 6. Engineer Witness: The engineer or engineer's representative reserves the right to observe tests or selected tests to assure compliance with the specifications.
- 7. Simultaneous Testing: Test observations by the AHJ, the Owner's representative and the engineer's representative need not occur simultaneously.
- 8. Do not perform TAB work until heating, ventilating, and air conditioning equipment has been completely installed and is operating continuously as required.
- 9. Conduct air testing and balancing with clean filters in place. Clean strainers prior to performing hydronic testing and balancing.
- 10. Agent Qualifications: Engage a TAB agent certified by AABC or NEBB.
- 11. TAB Conference: Meet with the Owner's and the Architect's representatives on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of TAB team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Provide 7 days advance notice of scheduled meeting time and location.
  - a. Agenda Items: Include at least the following:
    - 1) Submittal distribution requirements.
    - 2) Contract Documents examination report.
    - 3) TAB plan.
    - 4) Work schedule and Project site access requirements.
    - 5) Coordination and cooperation of trades and subcontractors.
    - 6) Coordination of documentation and communication flow.
- 12. Certification of TAB Reports: This certification includes the following:

- a. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  - b. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
13. TAB Reports: Use standard forms from AABC's "National Standards for Testing, Adjusting, and Balancing" and NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
14. Instrumentation Type, Quantity, and Accuracy: As described in AABC national standards and NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."
15. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
  - 1. TAB Agency provides warranty for a period of 90 days following submission of completed report, during which time, Owner may request a recheck of up to 10 percent of total number of terminals, or resetting of any outlet, coil, or device listed in the final TAB report.
  - 2. Guarantee: Meet the requirements of the following programs:
    - a. Provide a guarantee on AABC or NEBB forms stating that the agency will assist in completing the requirements of the Contract Documents if the TAB Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:
      - 1) The certified Agent has tested, adjusted, and balanced systems according to the Contract Documents.
      - 2) Systems are balanced to optimum performance capabilities within design and installation limits.

#### 1.7 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.

- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a persons skin than is normally dissipated.
- D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
- E. Report Forms: Test data sheets for recording test data in logical order.
- F. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.
- G. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.
- H. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- I. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- J. TAB: Testing, Adjusting, and Balancing.
- K. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.
- L. Test: A procedure to determine quantitative performance of a system or equipment.
- M. Testing, Adjusting, and Balancing (TAB) Agent: The entity responsible for performing and reporting the TAB procedures.
- N. AABC: Associated Air Balance Council.
- O. AMCA: Air Movement and Control Association.
- P. CTI: Cooling Tower Institute.
- Q. NEBB: National Environmental Balancing Bureau.
- R. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

## 1.8 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist TAB activities.
- B. Notice: Provide 7 days advance notice for each test. Include scheduled test dates and times.

- C. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

## **PART 2 - PRODUCTS - NOT USED**

## **PART 3 - EXECUTION**

### **3.1 GENERAL REQUIREMENTS AND PROCEDURES**

#### **A. Project Conditions:**

- 1. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire TAB period. Cooperate with the Owner during TAB operations to minimize conflicts with the Owner's operations.

#### **B. General Requirements:**

- 1. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and controls, coordinate scheduling and testing and inspection procedures with authorities having jurisdiction.
- 2. Perform TAB work with doors, closed windows, and ceilings installed etc., to obtain simulated or project operating conditions. Do not proceed until systems scheduled for TAB are clean and free from debris, dirt and discarded building materials.
- 3. Where Owner occupies building during the testing period, cooperate with Owner to minimize conflicts with Owner's operations.

#### **C. Examination:**

- 1. Examine Contract Documents to become familiar with project requirements and existing building record documents (if available) to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
  - a. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
  - b. Verify that balancing devices, such as test ports, gauge cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- 2. Examine approved submittal data of HVAC systems and equipment.
- 3. Examine project record documents described in Division 01, General Requirements.
- 4. Examine Architect's and Engineer's design data, including Basis of Design, HVAC system descriptions, statements of design assumptions for environmental

conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

5. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.
6. Coordinate requirements in system and equipment with this Section.
7. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
8. Examine system and equipment test reports.
9. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gauge cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
10. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.
11. Examine equipment for installation and for properly operating safety interlocks and controls.
12. Report deficiencies discovered before and during performance of TAB procedures.
13. Beginning of work means acceptance of existing conditions.

D. Preparation:

1. Prepare a TAB plan that includes strategies and step-by-step procedures.
2. Complete system readiness checks and prepare system readiness reports. Verify the following:
  - a. Permanent electrical power wiring is complete.
  - b. Hydronic systems are filled, clean, and free of air.
  - c. Automatic temperature-control systems are operational.

- d. Equipment and duct access doors are securely closed.
  - e. Balance, smoke, and fire dampers are open.
  - f. Isolating and balancing valves are open and control valves are operational.
  - g. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
  - h. Windows, doors and other portions of the building envelope can be closed so design conditions for system operations can be met.
- 3. Hold a pre-balancing meeting at least one week prior to starting TAB work.
    - a. Attendance is required by installers whose work will be tested, adjusted, or balanced.
  - 4. Provide instruments required for TAB operations. Make instruments available to Architect to facilitate spot checks during testing.

E. General TAB Procedures:

- 1. Perform TAB procedures on each system according to the procedures contained in AABC national standards or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
- 2. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.
- 3. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

F. Adjustment Tolerances:

- 1. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 5 percent of design for return and exhaust systems.
- 2. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- 3. Hydronic Systems: Adjust to within plus or minus 10 percent of design at coils and plus or minus 5 percent at system pumps and equipment.
- 4. Adjust supply, return, and exhaust air quantities to maintain pressurization in spaces indicated on Drawings. Note and document room-to-room pressurization



and maintain these relationships. Adjust pressure controlled spaces to within plus or minus 0.01 in WC.

G. Recording and Adjusting:

1. Field Logs: Maintain written logs including:
  - a. Running log of events and issues.
  - b. Discrepancies, deficient or uncompleted work by others.
  - c. Contract interpretation requests.
  - d. Lists of completed tests.
2. Ensure recorded data represents actual measured or observed conditions.
3. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
4. Mark on drawings locations where traverse and other critical measurements were taken and cross reference location in final report.
5. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
6. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
7. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by Owner's Representative, or Commissioning Agent.

3.2 FUNDAMENTAL AIR SYSTEMS BALANCING PROCEDURES

- A. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- B. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.
- C. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
- D. Prepare test reports for both fans and inlets and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross check the summation of required outlet volumes with required fan volumes.
- E. Prepare schematic diagrams of systems' "as-built" duct layouts.

- F. Determine the best locations in main and branch ducts for accurate duct airflow measurements.
- G. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.
- H. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- I. Verify that motor starters are equipped with thermal protection, sized for the connected load.
- J. Check dampers for proper position to achieve desired airflow path.
- K. Check for airflow blockages.
- L. Check that condensate drains are installed, trapped and primed and routed to drain.
- M. Check for readily observable leaks in air-handling unit components and ductwork.
- N. Use sheaves and pulleys to adjust the speed of belt drive fans to achieve design flow with motors running at 60 Hertz unless noted otherwise.

### 3.3 TEMPERATURE CONTROL VERIFICATION

- A. Examine automatic temperature system components to verify the following:
  - 1. Dampers, valves, and other controlled devices operate by the intended controller.
  - 2. Dampers and valves are in the position indicated by the controller.
  - 3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
  - 4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
  - 5. Thermostats and humidistats are located to avoid adverse effects of sunlight, equipment, drafts, and cold walls.
  - 6. Sensors are located to sense only the intended conditions.
  - 7. Sequence of operation for control modes is according to the Contract Documents.
  - 8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
  - 9. Interlocked systems are operating.
  - 10. Changeover from heating to cooling mode occurs according to design values.

- B. Verify that controllers are calibrated and commissioned.
- C. Check transmitter and controller locations and note conditions that would adversely affect control functions.
- D. Record controller settings and note variances between set points and actual measurements.
- E. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).
- F. Verify free travel and proper operation of control devices such as damper and valve operators.
- G. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water-flow measurements. Note the speed of response to input changes.
- H. Confirm interaction of electrically operated switch transducers.
- I. Confirm interaction of interlock and lockout systems.
- J. Verify main control supply-air pressure and observe compressor and dryer operations.
- K. Note operation of electric actuators using spring return for proper fail-safe operations.

### 3.4 DUAL-DUCT SYSTEMS ADDITIONAL PROCEDURES

- A. Set mixing boxes at full-cold airflow position for setting the fan volume. Apply diversity procedures for Variable Air Volume Systems if terminal unit total flow is greater than fan total.
- B. Measure static pressure in both hot and cold ducts at the end of the longest duct run.
- C. If insufficient static pressure exists to deliver design airflow, increase the airflow at the fan.
- D. Test and adjust the constant volume mixing boxes as follows:
  - 1. Verify both hot and cold operations by adjusting the thermostat and observing the air temperature and volume changes.
  - 2. Adjust mixing box to design airflows within specified tolerances. Measure the airflow by pitot-tube traverse readings, totaling the airflow of the outlets through the building automation system, or by measuring static pressure at mixing-box taps if provided by the box manufacturer.
  - 3. Adjust variable air volume, dual-duct systems in the same way as constant volume dual-duct systems, and adjust each mixing-box maximum- and minimum-airflow settings.

### 3.5 VARIABLE FLOW HYDRONIC SYSTEMS ADDITIONAL PROCEDURES

- A. Balance systems with automatic 2- and 3-way control valves by setting systems at maximum flow through heat-exchange terminals and proceed as specified above for hydronic systems.
- B. Balance system to achieve the lowest required differential pressure for the system to minimize pump brake horsepower.

### 3.6 PRE-BALANCE REPORTING

- A. Pre-Construction Phase Report:
  - 1. Provide a pre-construction phase TAB Plan at least 2 weeks prior to the commencement of TAB work. This report is to include:
    - a. A complete set of report forms intended for use on the project, with all data filled in except for the field readings. Forms to be project specific.
    - b. Marked up shop drawings identifying all HVAC equipment to be balanced, and associated outlets and terminal devices.
    - c. Identification of the type, manufacturer, and model of actual instruments to be used, and clear indication of which instrument will be used to take each type of reading. Calibration certifications are to be included.
    - d. A narrative of any project specific and/or non-standard TAB procedures to be used, and the equipment or systems they apply to.
- B. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- C. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced.

### 3.7 FINAL REPORTS

- A. Report Requirements:
  - 1. General:
    - a. Computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
    - b. Include a certification sheet in front of binder signed and sealed by the certified TAB engineer.

- 1) Include a list of the instruments used for procedures, along with proof of calibration.
- c. Final Report Contents: In addition to the certified field report data, include the following:
  - 1) Pump curves.
  - 2) Fan Curves
  - 3) Manufacturers Test Data
  - 4) Field test reports prepared by system and equipment installers.
  - 5) Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.
- B. General Report Data:
  1. In addition to the form titles and entries, include the following data in the final report, as applicable:
    - a. Title Page
    - b. Name and Address of TAB Agent
    - c. Project Name
    - d. Project Location
    - e. Architect's Name and Address
    - f. Engineer's Name and Address
    - g. Contractor's Name and Address
    - h. Report Date
    - i. Signature of TAB Agent who Certifies the Report
    - j. Summary of Contents, Including the Following:
      - 1) Design versus Final Performance
      - 2) Notable Characteristics of Systems
      - 3) Description of System Operation Sequence if it varies from the Contract Documents
    - k. Nomenclature Sheets for Each Item of Equipment
    - l. Data for Terminal Units, including Manufacturer, Type Size, and Fittings

- m. Notes to explain why certain final data in the body of reports vary from design values.
- n. Test Conditions for Fans and Pump Performance Forms, Including the Following:
  - 1) Settings for Outside-, Return-, and Exhaust-air Dampers
  - 2) Conditions of Filters
  - 3) Cooling Coil, Wet- and Dry-bulb Conditions
  - 4) Face and Bypass Damper Settings at Coils
  - 5) Fan Drive Settings, including Settings and Percentage of Maximum Pitch Diameter
  - 6) Inlet Vane Settings for Variable-Air-Volume Systems
  - 7) Settings for Supply-air, Static-pressure Controller
  - 8) Other System Operating Conditions that affect Performance
- C. System Diagrams:
  - 1. Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:
    - a. Quantities of Outside, Supply, Return, and Exhaust Airflows
    - b. Water and Steam Flow Rates
    - c. Duct, Outlet, and Inlet Sizes
    - d. Pipe and Valve Sizes and Locations
    - e. Terminal Units
    - f. Balancing Stations
- D. Air Handling Units:
  - 1. For air-handling units, split systems, fan coils, pumps, and evaporator units with coils, include the following:
    - a. Unit Data: Include the following:
      - 1) Unit Identification
      - 2) Location
      - 3) Make and Type

- 4) Model Number and Unit Size
- 5) Manufacturer's Serial Number
- 6) Unit Arrangement and Class
- 7) Discharge Arrangement
- 8) Sheave Make, Size in inches, and Bore
- 9) Sheave Dimensions, Center-to-center and Amount of Adjustments in Inches
- 10) Number of Belts, Make, and Size
- 11) Number of Filters, Type, and Size
- b. Motor Data: Include the following:
  - 1) Make and Frame Type and Size
  - 2) Horsepower and rpm
  - 3) Volts, Phase, and Hertz
  - 4) Full-load Amperage and Service Factor
  - 5) Sheave Make, Size in Inches, and Bore
  - 6) Sheave Dimensions, Center-to-center and Amount of Adjustments in Inches
- c. Test Data: Include design and actual values for the following:
  - 1) Total Airflow Rate in cfm (L/s)
  - 2) Total System Static Pressure in Inches wg (Pa)
  - 3) Fan rpm
  - 4) Discharge Static Pressure in Inches wg (Pa)
  - 5) Filter Static-pressure Differential in Inches wg (Pa)
  - 6) Preheat Coil Static-pressure Differential in Inches wg (Pa)
  - 7) Cooling Coil Static-pressure Differential in Inches wg (Pa)
  - 8) Heating Coil Static-pressure Differential in Inches wg (Pa)
  - 9) Outside Airflow in cfm (L/s)
  - 10) Return Airflow in cfm (L/s)

- 11) Outside-air Damper Position
- 12) Return-air Damper Position
- 13) Vortex Damper Position

E. Duct Traverses:

1. Include a diagram with a grid representing the duct cross-section and record the following:
  - a. Report Data: Include the following:
    - 1) System and Air-handling Unit Number
    - 2) Location and Zone
    - 3) Traverse Air Temperature in Degrees F
    - 4) Duct Static Pressure in Inches wg
    - 5) Duct Size in Inches
    - 6) Duct Area in SF
    - 7) Design Airflow Rate in cfm
    - 8) Design Velocity in fpm
    - 9) Actual Airflow Rate in cfm
    - 10) Actual Average Velocity in fpm
    - 11) Barometric Pressure in PSIG

F. Diffusers/Registers/Grilles:

1. For diffusers, registers and grilles, include the following:
  - a. Unit Data: Include the following:
    - 1) System and Air-handling Unit Identification
    - 2) Location and Zone
    - 3) Test Apparatus Used
    - 4) Area Served
    - 5) Air-terminal-device Make
    - 6) Air-terminal-device Number from System Diagram



- 7) Air-terminal-device Type and Model Number
- 8) Air-terminal-device Size
- 9) Air-terminal-device Effective Area in SF
- b. Test Data: Include design and actual values for the following:
  - 1) Airflow Rate in cfm
  - 2) Air Velocity in fpm
  - 3) Preliminary Airflow Rate as Needed in cfm
  - 4) Preliminary Velocity as Needed in fpm
  - 5) Final Airflow Rate in cfm
  - 6) Final Velocity in fpm
  - 7) Space Temperature in Degrees F
- G. Instrument Calibration:
  - 1. For instrument calibration, include the following:
    - a. Report Data: Include the following:
      - 1) Instrument Type and Make
      - 2) Serial Number
      - 3) Application.
      - 4) Dates of Use
    - b. Dates of Calibration.

### 3.8 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions.

### **END OF SECTION**

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**SECTION 23 07 00**

**HVAC INSULATION**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Type A, Flexible Glass Wool Blanket
2. Type B, Duct Liner
3. Type 2, Flexible Elastomeric Pipe Insulation
4. Jacketing
5. Accessories
6. Duct Insulation Accessories
7. Duct Insulation Compounds

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
1. Piping and duct insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
1. Installer qualifications.
  2. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any) for each type of product indicated.

3. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets with requirements indicated. Include dates of tests.
4. Installer Certificates: Signed by the Contractor certifying that installers comply with requirements.
5. Submit manufacturer's installation instructions.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  1. Formaldehyde Free: Should be third-party certified with UL Environment Validation.
  2. Recycled Content: A minimum of 40 percent post-consumer recycled glass content certified and UL validated.
  3. Low Emitting Materials: For all thermal and acoustical applications of Glass Mineral Wool Insulation products, provide materials complying with the testing and products requirements of UL GREENGUARD Gold Certification.
  4. Installer to have minimum 5 years' experience in the business of installing insulation.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

#### 1.7 FIRE HAZARD CLASSIFICATION

- A. Maximum fire hazard classification of the composite insulation construction as installed to be not more than a Flame Spread Index (FSI) of 25 and Smoke Developed Index (SDI) of 50 as tested by current edition of ASTM E84 (NFPA 255) method.
- B. Test pipe insulation in accordance with the requirements of current edition of UL "Pipe and Equipment Coverings R5583 400 8.15".
- C. Test duct insulation in accordance with current edition of ASTM E84, UL 723, NFPA 255, NFPA 90A and NFPA 90B.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Type A, Flexible Glass Wool Blanket:

1. Certainteed
  2. Johns Manville
  3. Knauf
  4. Owens-Corning
  5. Or approved equivalent.
- B. Type B, Duct Liner:
1. Certainteed
  2. Johns Manville
  3. Knauf
  4. Owens-Corning
  5. Or approved equivalent.
- C. Type 2, Flexible Elastomeric Pipe Insulation:
1. Glue:
    - a. Armacell LLC Armaflex Low VOC Adhesive
    - b. Halstead
    - c. Or approved equivalent.
  2. Paint:
    - a. Armacell LLC Armaflex
    - b. Halstead
    - c. Or approved equivalent.
- D. Jacketing:
1. ITW Insulation Systems
  2. Or approved equivalent.
- E. Accessories:
1. ITW Insulation Systems
  2. Or approved equivalent.
- F. Duct Insulation Accessories:

1. Certaineed
2. Johns Manville
3. Owens-Corning
4. Or approved equivalent.

G. Duct Insulation Compounds:

1. Certaineed
2. Johns Manville
3. Owens-Corning
4. Or approved equivalent.

2.2 TYPE A, FLEXIBLE GLASS WOOL BLANKET

- A. ASTM C553, Type 1, Class B-2; flexible blanket.
- B. 'K' Value: 0.27 BTU\*in/(hr\*sf°F) at 75 degrees F installed, maximum service temperature: 250 degrees F.
- C. Density: 0.75 pounds per cubic foot.
- D. Vapor Barrier Jacket: FSK aluminum foil reinforced with glass wool yarn and laminated to fire resistant Kraft, secured with UL listed pressure sensitive tape or outward clinched expanded staples and vapor barrier mastic as needed.
- E. DBDE-free. UL/E validated to be formaldehyde-free.

2.3 TYPE B, DUCT LINER

- A. ASTM C1071; flexible blanket.
- B. 'K' Value: ASTM C518, 0.25 BTU\*in/(hr\*sf°F) at 75 degrees F, maximum service temperature: 250 degrees F.
- C. Noise Reduction Coefficient: 0.65 or higher based on ASTM C 423 "Type A mounting."
- D. Maximum Velocity on Mat or Coated Air Side: 5,000 FPM.
- E. Adhesive: UL listed waterproof type.
- F. Fasteners: Duct liner galvanized steel pins, welded or mechanically fastened.
- G. Erosion-Resistant Surfaces: UL 181.
- H. ASTM G21 and ASTM G22 Microbial Growth Resistance.

- I. UL GREENGUARD Certified does not support the growth of mold, fungi, or bacteria per ASTM C 1338 and meets UL Environment GREENGUARD Microbial Resistance Listing per UL 2824-"GREENGUARD Certification Program Method for Measuring Microbial Resistance". DBDE-free. UL/E validated to be formaldehyde-free.

## 2.4 TYPE 2, FLEXIBLE ELASTOMERIC PIPE INSULATION

- A. Elastomeric Foam: ASTM C534; flexible, cellular elastomeric, molded or sheet.
  1. Thermal Conductivity Value: As indicated in the insulation tables below.
  2. Maximum Service Temperature of 220 degrees F.
  3. Maximum Flame Spread: 25.
  4. Maximum Smoke Developed: 50 (1-inch thick and below).
  5. Connection: Waterproof vapor retarder adhesive as needed.
  6. UV Protection: UV outdoor protective coating per manufacturer's requirements.
- B. Glue: Contact adhesive specifically manufactured for cementing flexible elastomeric foam. Armacell LLC Armaflex Low VOC adhesive, Halstead, or approved equivalent.
- C. Paint: Nonhardening high elasticity type, specifically manufactured as protective covering of flexible elastomeric foam insulation for prevention of degradation due to exposure to sunlight and weather. Armacell LLC Armaflex, Halstead, or approved equivalent.

## 2.5 JACKETING

- A. Canvas Jacket: UI listed fabric, 6 ounce/sq. yd., plain weave cotton treated with dilute fire retardant lagging adhesive.
- B. PVC preformed molded insulation covers. Zeston or approved equivalent.
- C. Aluminum Jacket: 0.016-inch-thick sheet, (smooth/embossed) finish, with longitudinal slip joints and 2-inch laps, die-shaped fitting covers with factory attached protective liner.
- D. Stainless Steel Jacket: Type 304 stainless steel, 0.010-inch, smooth finish.

## 2.6 ACCESSORIES

- A. Equipment Insulation Jacketing: Presized glass cloth, not less than 7.8 ounces/sq.yd., except as otherwise indicated. Coat with gypsum based cement.
- B. Equipment Insulation Compounds: Provide adhesives, cement, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.
- C. General: Provide staples, bands, wire, wire netting, tape corner angles, anchors, stud pins and metal covers as recommended by insulation manufacturer for applications

indicated. Accessories, i.e., adhesives, mastics, cements and tape to have the same flame and smoke component ratings as the insulation materials with which they are used. Shipping cartons to bear a label indicating that flame and smoke ratings do not exceed those listed above. Provide permanent treatment of jackets or facings to impart flame and smoke safety. Provide nonwater soluble treatments. Provide UV protection recommended by manufacturer for outdoor installation.

## 2.7 DUCT INSULATION ACCESSORIES

- A. Staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.

## 2.8 DUCT INSULATION COMPOUNDS

- A. Cements, adhesives, coatings, sealers, protective finishes and similar accessories as recommended by insulation manufacturer for applications indicated.

# PART 3 - EXECUTION

## 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Verification of Conditions:
  - 1. Do not apply insulation until pressure testing and inspection of ducts and piping has been completed.
  - 2. Examine areas and conditions under which duct and pipe insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Preparation: Clean and dry surfaces to be insulated.
- C. Installation:
  - 1. Insulation: Continuous through walls, floors and partitions except where noted otherwise.
  - 2. Piping and Equipment:
    - a. Install insulation over clean, dry surfaces with adjoining sections firmly butted together and covering surfaces. Fill voids and holes. Seal raw edges. Install insulation in a manner such that insulation may be split, removed, and reinstalled with vapor barrier tape on strainer caps and unions. Do not install insulation until piping has been leak tested and has passed such tests. Do not insulate manholes, equipment manufacturer's nameplates, handholes, and ASME stamps. Provide beveled edge at such insulation interruptions. Repair voids or tears.
    - b. Cover insulation on pipes above ground, outside of building, with aluminum jacketing. Position seam on bottom of pipe.
- D. Provide accessories as required. See Part 2 Article "Accessories" above.

- E. Protection and Replacement: Installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.
- F. Glass Wool Insulation:
  - 1. Lap seal insulation with waterproof adhesive. Do not use staples or other methods of attachment which would penetrate the vapor barrier. Apply fitting covers with seated tacks and vapor barrier tape.
  - 2. Apply insulation to pipe and seal with self-sealing lap. Use self-sealing butt strips to seal butt joints. Insulate fittings, valves and unions with single or multiple layers of insulation and cover to match pipe or use performed PVC molded insulation covers.
- G. Labeling and Marking: Provide labels, arrows and color on piping and ductwork. Attach labels and flow direction arrows to the jacketing per Section 23 05 53, Identification for HVAC Piping, Ductwork and Equipment.
- H. Ductwork:
  - 1. Install insulation in conformance with manufacturer's recommendations to completely cover duct.
  - 2. Butt insulation joints firmly together and install jackets and tapes smoothly and securely.
  - 3. Apply duct insulation continuously through sleeves and prepared openings, except as otherwise specified. Apply vapor barrier materials to form complete unbroken vapor seal over insulation.
  - 4. Coat staples and seals with vapor barrier coating.
  - 5. Cover breaks in jacket materials with patches of same material as vapor barrier. Extend patches not less than 2-inches beyond break or penetration on all directions and secure with adhesive and staples. Seal staples and joints with vapor barrier coating.
  - 6. Fill jacket penetrations. i.e., hangers, thermometers and damper operating rods, and other voids in insulation with vapor barrier coating. Seal penetration with vapor barrier coating. Insulate Hangers and Supports for cold duct in un-conditioned spaces to extent to prevent condensation on surfaces.
  - 7. Seal and flash insulation terminations and pin punctures with reinforced vapor barrier coating.
  - 8. Continue insulation at fire dampers and fire/smoke dampers up to and including those portions of damper frame visible at outside of the rated fire barrier. Insulating terminations at fire dampers in accordance with this Section.
  - 9. Do not conceal duct access doors with insulation. Install insulation terminations at access door in accordance with this Section.



- I. Insulated Pipe Exposed to Weather: Where piping is exposed to weather, cover insulation with aluminum jacket. Seal watertight jacket per manufacturer's recommendations. Install metal jacket with 2-inch overlap at longitudinal and butt joints with exposed lap pointing down. Secure jacket with stainless-steel draw bands 12-inches on center and at butt joints.
- J. Insulation Shields: Provide hangers and shields (18 gauge minimum) outside of insulation for cold piping (<60 degrees F). Hot water piping hangers may penetrate insulation to contact pipe directly. Provide 18-inch long, noncompressible insulation section at insulation shields for lines 2-inches and larger for steam and chilled water piping.
- K. Ductwork Surfaces to be Insulated:

Item to be Insulated	System Insulation Type	Duct Size	Insulation Thickness
Supply ductwork where duct is not specified to be lined.	A	All	1-1/2-inch
Return ductwork where duct is not specified to be lined or where ductboard is not utilized.	--	All	None

- 1. Note: Insulation thickness shown is a minimum. If state codes require additional thickness, then provide insulation thickness per code requirements.

- L. Piping Surfaces to be Insulated:

Item to be Insulated	System Insulation Type	Conductivity Range (Btu-inch per hour per SF per degrees F)	Pipe Size (inches)	Insulation Thickness (inches)
Refrigerant Suction Piping (40F to 60F)	2	0.21-0.27 at a mean rating temperature of 75 degrees F	<1	0.5
			1 to <1.5	0.5
			1.5 to <4	1.0
			4 to <8	1.0
			>= 8	1.0

Refrigerant Suction Piping (≤40F)	2	0.20-0.26 at a mean rating temperature of 50 degrees F	<1	0.5
			1 to <1.5	1.0
			1.5 <4	1.0
			4 to <8	1.0
			≥ 8	1.0

1. Note: Insulation thickness shown is a minimum. If state code requires additional thickness, then provide insulation thickness per code requirements.

### 3.2 TYPE A, FLEXIBLE GLASS WOOL BLANKET

- A. Install insulation in conformance with manufacturer's recommendations and requirements.
- B. Duct Wrap: Cover air ducts per insulation table except ducts internally lined where internal duct lining is adequate to achieve adequate insulating values to meet local Energy Codes (indicate on shop drawings, locations where duct wrap is planned to be omitted and indicate internal duct lining insulating values to confirm they will meet the Energy Code.) Wrap tightly with circumferential joints butted and longitudinal joints overlapped minimum of 2-inches. On ducts over 24-inches wide, additionally secure insulation with suitable mechanical fasteners at 18-inches on center. Circumferential and longitudinal joints stapled with flare staples 6-inches on center and covered with 3-inch wide, foil reinforced tape.

### 3.3 TYPE B, DUCT LINER

- A. Install insulation in conformance with manufacturer's recommendations and requirements.
- B. Duct Liners: Mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with continuous (minimum 90) percent coat of adhesive. Secure liner with mechanical fasteners 15-inches on center or per manufacturer requirements. Accurately cut liner and thoroughly coat ends with adhesive. Butt joints tightly. Top and bottom Sections of insulation overlap sides. Factory/field coat exposed edges. Metal nosing for exposed leading or transverse edges and when velocity exceeds 3500 FPM or manufacturer rating on exposed edges. Keep duct liner clean and free from dust. At completion of project, vacuum duct liner if it is dirty or dusty. Do not use small pieces. If insulation is installed without horizontal, longitudinal, and end joints butted together, installation will be rejected and work removed and replaced with work that conforms to this Specification.

### 3.4 TYPE 2, FLEXIBLE ELASTOMERIC PIPE INSULATION

- A. Flexible Elastomeric Insulation:
  1. Slip insulation on pipe prior to connection. Butt joints sealed with manufacturer's adhesive. Insulate fitting with miter-cut pieces. Cover insulation exposed to

weather and below grade with two coats of finish as recommended by manufacturer.

B. Flexible Elastomeric Tubing:

1. Flexible Elastomeric Tubing: Slip insulation over piping or, if piping is already installed, slit insulation and snap over piping. Joints and butt ends must be adhered with 520 adhesive.

C. Install insulation in conformance with manufacturer's recommendations and requirements.

D. See General Installation Requirements above.

E. Slip insulation on pipe prior to connection. Butt joints sealed with manufacturer's adhesive. Insulate fitting with miter-cut pieces. Cover insulation exposed to weather and undergrade with two coats of finish as recommended by manufacturer.

F. Insulation Shields: Provide hangers and shields (18 gauge minimum) outside of insulation for cold piping (<60 degrees F). Hot water piping hangers may penetrate insulation to contact pipe directly. Provide 18-inch long, noncompressible insulation section at insulation shields for lines 2-inches and larger (hot and cold piping).

G. Install in accordance with manufacturer's instructions for below grade installation.

### 3.5 JACKETING

A. See General Installation Requirements above.

B. Install in accordance with manufacturer's instructions.

### 3.6 ACCESSORIES

A. Install insulation in conformance with manufacturer's instructions, recommendations and requirements.

B. See General Installation Requirements above.

C. Provide and install accessories for all insulation types listed in this Section.

### 3.7 DUCT INSULATION ACCESSORIES

A. Install insulation in conformance with manufacturer's recommendations and requirements.

### 3.8 DUCT INSULATION COMPOUNDS

A. Install insulation in conformance with manufacturer's recommendations and requirements.

**END OF SECTION**

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**SECTION 23 09 00**

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**INSTRUMENTATION AND CONTROL PERFORMANCE SPECIFICATIONS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

**A. Work Included:**

1. Communications
2. Operator Interface
3. Controller Software
4. Web Based Access
5. BAS Graphics
6. Building Controllers
7. Application Specific Controllers
8. Application Specific Controller - Terminal Unit Controllers
9. Input/Output Interface
10. Power Supplies and Line Filtering
11. Control Panels
12. Auxiliary Control Devices
13. Wiring and Raceways
14. Smoke Detection for Projects with a Building Fire Alarm System

- B.** This is a performance specification and Contractor is responsible for design tasks and engineering.

**1.2 RELATED SECTIONS**

- A.** Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A.** References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:

1. Current edition of ANSI/ASHRAE Standard 135 and addendum, BACnet.
2. Current edition of UL 916 Underwriters Laboratories Standard for Energy Management Equipment, Canada and the US.
3. Current edition of FCC Part 15, Subpart J, Class A.
4. Current edition of BACnet Testing Laboratories (BTL).

#### 1.4 SUBMITTALS

A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, provide:

1. Prepare and submit a detailed schedule of work. Schedule to identify milestones such as equipment submittals, control panel diagrams, color graphic panel displays, Interlock.
2. Wiring diagrams, control program sequence software flow chart diagrams, conduit layout diagrams, device location diagrams, equipment and component deliveries, installation sequencing, controller startup, point to point startup, control programming, sequence testing, commissioning/acceptance testing and training.
3. Submit design drawings, sequences of operation, program listings, software flow charts and details for each typical piece of equipment and system being controlled. No work to be initiated or fabrication of any equipment started prior to the Owner's Representatives return of REVIEWED submittals.
  - a. Sequence of Operation: The sequence of operation included in the design documents is intended only to communicate the Engineers' general control intent and is not to be used as a direct reference for programming of the EMS system. Verbatim duplication of the Engineer's Sequence of Operation on the submittals is discouraged and may result in non-approval of the submittal. Sequence of operation on submittals to accurately detail the system's intended programming, and include details of enhancements, adjustments, or deviations from the Engineer's sequence of operation. Submitted sequence of operation to be written with a logical and organized format and flow. Provide detailed, clear and unambiguous sequence of operation language. Point descriptors and point nomenclature referenced in the submitted sequence of operation to match those (to be) actually programmed. As-built submittal Sequence of Operation to include modifications to the programming made as a result of any addendum, bulletins, RFI's, change orders, and commissioning.

4. Format: Make each submittal in one complete and contiguous package. Partial or unmarked submittals will be rejected without review.
5. Submit Manufacturers Data as Follows:
  - a. Complete materials list of items proposed to be furnished and installed. A complete Bill of Materials, listing materials, components, devices, wire and equipment are required for this work. The Bill of Materials to be separate for each controller on its own page(s) and to contain the following information for each item listed:
    - 1) Manufacturer's Name and Model number with furnished options highlighted.
    - 2) Quantity of each by controller location.
    - 3) Description of product (generic).
    - 4) Specified item.
    - 5) Operating range or span.
    - 6) Operating point or setpoint.
  - b. Manufacturer's specifications and other data required demonstrating compliance with the specified requirements, including but not limited to: Catalog cuts, technical data and descriptive literature on hardware, software, and system components to be furnished.
  - c. The data to be clearly marked and noted to identify specific ranges, model numbers, sizes, and other pertinent data. Submit printed manufacturer's technical product data for each control device furnished, indicating dimensions, capacities, performance characteristics, electrical characteristics, finishes of materials and including printed installation instructions and start-up instructions.
  - d. Unless specifically called for otherwise, provide bound copies of catalog cuts for standard products, not requiring specifically prepared Shop Drawings, for the following:
    - 1) Wire and Cable, Class II
    - 2) Face Plates for Devices
    - 3) Disconnect Switches for Power Control
  - e. Where more than one item, size, rating or other variations appear on a catalog cut sheet, clearly identify items to be provided. These items to be properly indexed and referenced to identification numbers, designations and/or details on the Drawings.

6. Shop Drawings: Submit shop drawings for each controlled system, depicting the following information:
  - a. Schematic flow diagram of system showing fans, pumps, coils, dampers, valves and other control/monitoring devices.
  - b. Label each control device with initial setting or adjustable range of control. Label points in schematic diagrams with termination at corresponding controller.
  - c. Electrical Wiring: Clearly differentiate between portions of wiring that are factory installed and portions of be field-installed.
  - d. Details of control panel faces, including controls, instruments, and labeling.
  - e. Interfaces to equipment furnished under other Specification Sections identifying numbers of wires, termination location, voltages and pertinent details. Responsibility for each end of the interfaces to be noted on these drawings whether or not they are a part of this Section.
  - f. System architecture diagram showing the global connectivity of new controllers and any existing systems that will be connected to.
7. Equipment locations, wiring and piping schematics, details, panel configurations, sizes, damper motor mounting details, valve schedules, and a points list keyed to specific hardware submittals. Control wiring depicted as fully annotated ladder diagrams with terminations identified, completely configured as to the exact panel, wiring, relay, switch, and component configuration.
8. Tag Number Lists: Develop instruments tag number system and submit list for approval. Coordinate methods and number block with the Owner Representative.
9. Format the Shop and Field Drawings to Include:
  - a. A Title Sheet containing a drawing list, abbreviations list, symbols list, site and vicinity maps for project location and schedules.
  - b. Floor Plans showing proposed device locations and device nomenclatures.
  - c. A Riser Diagram illustrating conduit relationships between devices shown on the Floor Plans. Show device nomenclatures.
  - d. A Single-Line Diagram for each system showing signal relationships of devices within the system. Show device nomenclatures.
  - e. A Wiring Diagram for each assembly, enclosure or free standing device, showing:
    - 1) The Devices Within
    - 2) Wiring Connections

- 3) Wire Identification
  - 4) Voltage Levels
  - 5) Fuse Ratings
- f. Operations and Maintenance Manuals:
- 1) Following approval of Shop Drawings of control equipment and prior to acceptance of control work, prepare Operating and Maintenance manuals describing operating, servicing, and maintenance requirements of control systems and equipment installed under this Section, in accordance the General and Special Conditions of these Specifications.
  - 2) Information contained in the manual for the above equipment to include the following:
    - a) Manufacturer's catalog cuts and printed descriptive bulletins.
    - b) Manufacturer's installation, operating, and maintenance instruction booklets. Complete instructions regarding the operation and maintenance of equipment involved.
    - c) Instrument calibration certificates.
    - d) Parts list and costs.
    - e) Complete nomenclature of replaceable parts, list of recommended spare parts for 12 months operation, their part numbers, current cost and name and address of the nearest vendor of replacement parts.
    - f) Name, address and telephone number for closest source of spare parts.
    - g) Wiring and schematic diagrams.
    - h) Include final record copies of shop drawings.
    - i) Copy of guarantees and warranties issued for the various items of equipment, showing dates of expiration.
    - j) Reduced plans, diagrams, and control schematics.
    - k) Copies of test results.
    - l) Control System Operating Manual including: point of summary and point data base; complete printout of program listings; magnetic tape CD or DVD backup of Field Control Cabinet programs; cabinet layout; hard copy of graphic screens; hard copy of specified reports.



- g. A final Bill of Quantities including a separate schedule for portable equipment, if delivered as part of this work.
- h. Performance, Test and Adjustment Data: Comprehensive documentation of performance verification according to parameters specified in these specifications.
- i. Record Drawings: Comply with Division 01, General Requirements and Section 23 00 00, HVAC Basic Requirements. Provide complete as-built submittals including "as-programmed" sequence of operation as well as final occupancy schedules.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Installer Qualifications: Company specializing in performing work of the type specified in this Section with minimum five year's experience in the local area. Installers required to have successfully completed manufacturer's control system factory training.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

#### 1.7 SYSTEM DESCRIPTION

- A. Control system referenced throughout specifications and drawings as Building Automation System (BAS), Building Management System (BMS), or Energy Management System (EMS) interchangeably consists of high-speed, peer-to-peer network of DDC controllers, control system server, and operator workstation. System to be UUKL listed if used for smoke control.
- B. System software based on server/thin-client architecture, designed around open standards of web technology. Control system server accessed using a web browser over control system network, Owner's local area network, and remotely over Internet (through Owner's LAN). Intent of thin-client architecture is to provide operators complete access to control system via web browser. No special software other than web browser required to access graphics, point displays, and trends.
- C. Local Area Network (LAN) either 10 or 100 Mbps Ethernet network.
- D. System will consist of open architecture that is capable of:
  - 1. High speed Ethernet communication using TCP/IP protocol.

2. Native BACnet communications according to ANSI / ASHRAE Standard 135, latest edition. Provide necessary BACnet-compliant hardware and software to meet the system's functional specifications. Controller devices must be BTL tested and listed by an official BACnet Testing Laboratory and have the BTL mark issued.
- E. Complete temperature control system to be DDC with electronic sensors and electronic/electric actuation valves and dampers.
- F. Prepare individual hardware layouts, interconnection drawings, building riser/architecture diagram and sequence of control from the project design data. Any architecture diagrams on design drawings have been included as schematics only and are not meant to portray quantity of devices or power/data requirements.
- G. Design, provide, and install equipment cabinets, panels, data communication network infrastructure (including cables, conduits, outlets, connections, etc.) needed, and associated hardware.
- H. Provide complete manufacturer's specifications for items that are supplied. Include vendor name and model number of every item supplied.
- I. Provide a comprehensive operator and technician training program as described in these Specifications.
- J. Provide as-built documentation, operator's terminal software, diagrams, and other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.
- K. Provide 120V power, low voltage power, transformers, etc. for control panels, transformer panels, and BAS devices. Install per Division 26, Electrical Specifications. Power for devices within this Specification Section is solely the responsibility of the BAS Contractor.
- L. Conduit and raceway systems. Provide per Division 26, Electrical Specifications.
- M. Devices, components, controllers, and software to be manufacturer's most current version at the time of installation.

## 1.8 SYSTEM PERFORMANCE

- A. Performance Standards - System conforms to following minimum standards over network connections:
  1. Graphic Display: Graphic with 20 dynamic points display with current data within 10 seconds.
  2. Graphic Refresh: Graphic with 20 dynamic points update with current data within 8 seconds.
  3. Object Command: Devices react to command of binary object within 2 seconds. Devices begin reacting to command of analog object within 2 seconds.

4. Object Scan: Data used or displayed at controller or workstation have been current within previous 6 seconds.
  5. Alarm Response Time: Object that goes into alarm is annunciated at workstation within 45 seconds.
  6. Program Execution Frequency: Custom and standard applications are capable of running as often as once every 5 seconds. Select execution times consistent with mechanical process under control.
  7. Performance: Programmable controllers are able to completely execute DDC PID control loops at frequency adjustable down to once per second. Select execution times consistent with mechanical process under control.
  8. Multiple Alarm Annunciation: Each workstation on network receive alarms within 5 seconds of other workstations.
- B. Reporting Accuracy: System reports values with minimum end-to-end accuracy listed in Reporting Accuracy Table below.

1. Reporting Accuracy Table:

Measure Variable	Reported Accuracy
Space Temperature	Plus or Minus 1 degree F
Ducted Air	Plus or Minus 1 degrees F
Outside Air	Plus or Minus 2 degrees F
Dew Point	Plus or Minus 3 degrees F
Water Temperature	Plus or Minus 1 degree F
Delta-T	Plus or Minus 0.25 degree F
Relative Humidity	Plus or Minus 5 percent RH
Water Flow	Plus or Minus 2 percent of full scale

2. Note 1: Accuracy applies to 10 percent-100 percent of scale
  3. Note 2: For both absolute and differential pressure
  4. Note 3: Not including utility-supplied meters
- C. Control Stability and Accuracy. Control loops maintain measured variable at setpoint within tolerances listed in Control Stability and Accuracy Table below.

1. Control Stability and Accuracy Table:

Controlled Variable	Control Accuracy	Range of Medium
Air Pressure	Plus or minus 0.2 inch wg	0-6 inch wg
	Plus or minus 0.01 inch wg	-0.1 to 0.1 inch wg
Airflow	Plus or minus 10 percent of full scale	

Space Temperature	Plus or minus 2.00 degrees F	
Duct Temperature	Plus or minus 3.0 degrees F	
Humidity	Plus or minus 5 percent RH	
Fluid Pressure	Plus or minus 1.5 PSI	1-150 PSI
	Plus or minus 1.0 inch wg	0-50 inch wg differential

## **PART 2 - PRODUCTS**

### **2.1 NORTHERN CALIFORNIA MANUFACTURERS/INSTALLERS**

- A. Siemens/Siemens
- B. Johnson Controls/Johnson Controls Bay Metro Office
- C. Invensys/Invensys Systems, Wonderware NorCal, JPR Systems, Inc
- D. Alerton/Syserco Inc
- E. Automated Logic/Sunbelt Controls, Air Systems Inc
- F. Delta Controls/Delta Controls Inc
- G. Reliable Controls/Core Controls Inc, American Mechanical Inc
- H. Andover (Schneider Electric)/Steven Engineering, Alameda Electrical Distributors Inc, Graybar Electric Company Inc, Powermatic Associates
- I. Trane/Trane, Specialty AC Products Inc.
- J. Or approved equivalent.
- K. Duct/Spot-Type Smoke Detectors (Project with Fire Alarm System):
  - 1. See Division 28 for Products.

### **2.2 COMMUNICATIONS**

- A. Each controller to have communication port for connection to operator interface.
  - 1. Internetwork operator interface and value passing to be transparent to internetwork architecture.
  - 2. Operator interface connected to controller to allow operator to interface with each internetwork controller as if directly connected. Controller information such as data, status, reports, system software, and custom programs to be viewable and editable from each internetwork controller.

- B. Inputs, outputs, and control variables used to integrate control strategies across multiple controllers to be readable by each controller on internetwork.
- C. Operator Workstation to be capable of simultaneous direct connection and communication with BACnet/IP, OPC and TCP/IP networks without use of interposing devices such as PC or gateway with hard drive.
- D. Workstations, Building Control Panels and Controllers with real-time clocks use time synchronization service. System automatically synchronizes system clocks daily from operator-designated device via internetwork. System automatically adjusts for daylight savings and standard time as applicable.
- E. Wireless Network Communications:
  - 1. Wireless communications take place using modular wireless transceivers at each device, which eliminates need for communication cabling.
  - 2. Wireless transceiver utilizes 2.4 GHz in license free global Industrial Scientific and Medical (ISM) band.
  - 3. Wireless transceiver is encased in plenum-rated enclosure. If application dictates, wireless transceiver is able to be installed in metal enclosure utilizing remote mounted antenna.
  - 4. Wireless transceiver channel is factory set and capable of being field set to different channel if interference with IEEE 802.11 devices or other 2.4 GHz products is encountered.
  - 5. Wireless transceiver is 24 VAC powered.
  - 6. Wireless transceiver gives a visual indication that it is powered and communicating.
  - 7. Wireless transceiver has a field-settable network identifier that allows multiple networks to occupy same channel for maximum scalability.

## 2.3 OPERATOR INTERFACE

- A. Operator Interface: PC-based workstations reside on high-speed network with building controllers. Each workstation or each standard browser connected to server is able to access system information.
- B. Hardware: Each operator workstation or web server consists of the following:
  - 1. Computer: Hardware meets or exceeds DDC system manufacturer's recommended specifications and meet response times specified elsewhere in this document. Following hardware requirements also apply:
    - a. Hard disk have sufficient memory to store:
      - 1) Required operator workstation software.

- 2) One year of trend data based on points specified to be trended at specified trend intervals.
- b. Minimum hardware configuration includes:
  - 1) Intel i7 Processor
  - 2) 22-in LCD Monitor with at least 1024 x 768 Resolution
  - 3) 8 GB of RAM
  - 4) 48x CD-RW/DVD Optical Drive
  - 5) 1 TB Hard Disk Drive Providing Data at 3 GB/sec
  - 6) Ethernet 10/100 Network Interface Card
  - 7) High Performance Graphics Card
  - 8) Keyboard and Mouse
  - 9) Color Inkjet Printer
  - 10) UPS (uninterruptible power supply) installed at server, sized with sufficient capacity to allow full operation for 10 minutes or more.
2. Modem: Auto-dial modem and associated cables transmit over voice-grade telephone lines at nominal 56Kb between workstation or web server and remote buildings and workstations.
3. Portable Operator's Terminal: Portable Operator's Terminal capable of accessing system data. This device may be connected to any point on system network or to any controller for programming, setup, and troubleshooting. Portable Operator's Terminal is IBM-compatible notebook-style PC including software and hardware required. PC contains at minimum:
  - a. Intel i5 Processor
  - b. 15-in LCD Monitor with at least 1024 x 768 Resolution
  - c. 8 GB of RAM
  - d. 1 TB Hard Drive
  - e. Touch-Pad or Other Internal Pointing Device
  - f. High-Performance Graphics Adapter
  - g. Ethernet 10/100 Network Interface Card
  - h. Integrated Wireless 802.11 b/g/n

- i. Serial Port and CD/RW-ROM
  - j. Internal Modem, 56Kb Minimum
- C. System Software:
- 1. Operating System: Furnish concurrent multi-tasking operating system. Operating system also supports use of and includes other common software applications such as Microsoft Excel, Word, Microsoft Access and Adobe Acrobat. Acceptable operating systems are Windows 7 and Windows 10.
  - 2. Dynamic Color Graphics:
    - a. Real-time color graphic displays dynamic and able to update displays.
    - b. Provide operator ability to change values (setpoints) and states in system controlled equipment directly from graphic display.
    - c. Custom Graphics. Provide custom graphics generation package.
    - d. Graphics Library. Furnish library of standard HVAC equipment graphics and include standard symbols for fans, pumps, coils, valves, piping, dampers, and ductwork.
  - 3. Software to be manufacturer's most current version at the time of installation.
- D. System Applications: Each workstation provides operator interface and off-line storage of system information. Provide following applications at each workstation:
- 1. Automatic System Database Save and Restore: Each workstation stores on hard disk copy of current database of each Building Controller. This database automatically updated whenever change is made in any system panel.
  - 2. Manual Database Save and Restore: System operator able to manually save or clear database and initiate download of specified database from/to any panel.
  - 3. System Configuration: Workstation software provides method of configuring system to allow for changes or additions by users and performs following tasks:
    - a. Create, delete or modify control strategies.
    - b. Add/delete objects to system.
    - c. Tune control loops through adjustment of control loop parameters.
    - d. Enable or disable control strategies.
    - e. Generate hard copy records of control strategies on printer.
    - f. Select points to be alarmed and define alarm state.



- g. Select points to be trended and initiate automatic recording of values.
  - h. Start/Stop binary objects and adjust analog objects.
- 4. Security: Operator required to log on to system with user name and password in order to view, edit, add, or delete data. System security selectable for each operator.
- 5. System Diagnostics: System automatically monitor operation of workstations, printers, modems, network connections, building management panels, and controllers. Failure of any device to be annunciated.
- 6. Alarm Indication and Handling:
  - a. Workstation provides visual means of alarm indication. Alarm indication becomes highest priority regardless of application(s) running.
  - b. System provides and archive log of alarm messages to hard drive. Alarm messages to include description of event-initiating object, source, location and time/date of alarm.
- 7. Trend Logs: Operator able to define custom trend log for any data object and include interval, start time, and stop time. Trend data sampled and stored on building controller panel, is archived on hard disk, and is retrievable for use in spreadsheets and standard database programs.
  - a. System server to periodically gather historically recorded data stored in the building controllers and archive the information. Archived files to be appended with new sample data, allowing samples to be accumulated.
  - b. Software to be included that is capable of graphing the trend logged object data. Software capable of creating two-axis (x,y) graphs that display object values relative to time.
  - c. Operator able to change trend log setup information. This includes the information to be logged as well as the interval at which it is to be logged. Input, output, and value object types in the system may be logged. Provide operations password protected. Setup and viewing may be accessed directly from any graphics on which object is displayed.
  - d. BAS Contractor to enable trending for any system points (physical or virtual) as directed by the Engineer, Owner or Commissioning Authority (Commissioning Authority). There will be no limit on the number of trended points the BAS Contractor is to set up. BAS Contractor will modify trend setup parameters as directed by the Commissioning Authority during testing. BAS Contractor to be proactive and enable trending for major system points during system startup/programming. BAS Contractor is not to wait for direction to begin trending points. Trend data for each point to be archived on the main server for a minimum of one year. Trend data archiving to be enabled immediately upon trend setup, or as soon as communication



between the field panel and sever is established. Trend data uploads from field panel to server set up to be automatically performed with sufficient frequency to ensure no data gaps or loss of trend data.

- e. Trend points as identified in the points list. Provide system specific trend data in two-axis (x,y) graphs that display object values relative to time to Engineer, Owner, or Commissioning Authority.
8. Standard Reports: Standard system reports provided for this project. Provide ability for Owner to readily customize these reports for this project:
- a. Objects: System (or subsystem) objects and their current values.
  - b. Logs:
    - 1) Alarm History
    - 2) System Messages
    - 3) System Events
    - 4) Trends
9. Electrical, Gas, and Weather Report:
- a. System server capable of periodically gathering energy log data stored in the field equipment and archive the information. Archive files appended with new data, allowing data to be accumulated.
  - b. Operator able to change the energy log setup information as well. This includes the meters to be logged, meter pulse value, and the type of energy units to be logged. Meters monitored by the system may be logged.
  - c. System to display archived data in tabular format form for both consumption and peak values. Data shown in hourly, daily, weekly, monthly and yearly formats. In each format the user able to select a specific period of data to view.
  - d. Electrical Meter Report: Provide monthly report showing daily electrical consumption and peak electrical demand with time and date stamp for each building meter and for each electrical sub-meter on individual building panels, circuits, equipment (such as chillers), and variable frequency drives. Provide an annual (12-month) report showing monthly electrical consumption and peak electrical demand with time and date stamp for each individual meter.
  - e. Gas Meter Report: Provide monthly report showing daily natural gas consumption for each meter and sub-meter. Provide annual (12-month) report that shows monthly consumption for each meter.

- f. Weather Data Report: Provide monthly report showing daily minimum, maximum, and average outdoor air temperature (dry bulb, wet bulb) and humidity. Provide annual (12-month) report showing minimum, maximum, and average outdoor air temperature for month.
- E. Interfaces to Third Party Systems: BAS connects to third party systems (VFDs, chillers, emergency generators, rooftop AC units, etc.). Communication protocol specified for third party system, and BAS provides compatible protocol to assure proper two way communication. Points, alarms, and commands displayed on BAS as indicated.
- F. Workstation Applications Editors: Each PC workstation supports editing of system applications, which downloaded and executed at one or more controller panels.

## 2.4 CONTROLLER SOFTWARE

- A. Furnish following applications software for building and energy management. Software applications reside and operate in system controllers. Software to be manufacturer's most current version at the time of installation. Software and associated functions (scheduling, optimum start/stop, etc.) noted in this specification are to be configured and enabled for this project. Incorporate into sequence of operation submittals for review prior to installation.
- B. System Security:
  - 1. User access secured using individual security passwords and user names.
  - 2. Restrict user passwords to objects, applications, and system functions as assigned by system manager. Provide monitoring only access to Engineer of Record and Commissioning Authority for period of one year for trouble shooting purposes.
  - 3. Record user Log On/Log Off attempts.
  - 4. Provide passwords, user names, and access assignments adjustable at the operator's terminal. Each user to have a set security level, which defines access to displays and individual objects the user may control. System to include 10 separate and distinct security levels for assignment to users.
  - 5. System to include an Auto Logout Feature that will automatically logout user when there has been no keyboard or mouse activity for a set period of time. Time period to be adjustable by system administrator. Auto Logout may be enabled and disabled by system administrator. Operator terminal to display message on screen that user is logged out after Auto Logout occurs.
- C. Scheduling: Provide capability to schedule each object or group of objects in system. Coordinate schedule with Owner and program accordingly. Each schedule consists of:

1. Operator's workstation to show information in easy-to-read daily format. Priority for scheduling: Events, holidays and daily with events being the highest.
  2. Holiday and special event schedules to display data in calendar format. Operator able to schedule holidays and special events directly from these calendars.
  3. Operator able to change information for a given weekly or exception schedule if logged on with the appropriate security access.
- D. Optimum Start/Stop: Provide software and program system to start equipment on sliding schedule based upon indoor and outdoor conditions. Determine minimum time of HVAC system operation needed to satisfy space environmental requirements and also determine earliest possible time to stop mechanical systems (i.e. shut down cooling/heating and only provide ventilation one hour prior to scheduled unoccupied period.) Optimum start/stop program operates in conjunction with scheduled start/stop and night setback programs.
- E. Alarms:
1. Operator's workstation to provide visual means of alarm indication. The alarm dialog box to always become the top dialog box regardless of the application(s), currently running.
  2. System to provide log of alarm messages. Alarm log to be archived to the hard disk of the system operator's terminal. Each entry to include a description of the event-initiating object generating the alarm. Entry to include time and date of alarm occurrence.
  3. Alarm messages in user-definable text and entered either at the operator's terminal or via remote communication.
  4. Each binary object set to alarm based on operator-specified state.
  5. Each analog object have both high and low alarm limits.
  6. Alarms must be able to be automatically and manually disabled.
  7. Alarms are routed to appropriate workstations based on time and other conditions. An alarm is able to start programs, print, be logged in event log, generate custom messages, and display graphics.
  8. System have ability to dial out in event of alarm.
  9. Alarm Levels:
    - a. Provide 5 levels of alarm as follows, and program alarm levels for every required and specified alarm:
      - 1) Level 1: Critical/life safety.
      - 2) Level 2: Significant equipment failure.

- 3) Level 3: Non-critical equipment failure/operation.
  - 4) Level 4: Energy conservation monitor.
  - 5) Level 5: Maintenance indication, notification.
- b. Prior to training of Owner's representative, submit the complete Points List and suggested Alarm Levels to the Owner.
- c. During training of Owner's representative(s):
- 1) Discuss Alarm Levels and the alarms currently included in the BAS.
  - 2) Provide additional alarms without addition of new hardware points, as required by Owner's Representative.
  - 3) Agree with the Owner's Representative on action(s) to be taken for each alarm level and implement same for each alarm. Said action to include visual and/or audible alarm(s) at the Operator workstation including whether Operator acknowledgement is required or not, email messages, and text messages.

F. Demand Limiting:

1. System to include demand limiting program that includes two types of load shedding. One type of load shedding to shed/restore equipment in binary fashion based on energy usage when compared to shed and restore settings. The other type of shedding to adjust operator selected control setpoints in an analog fashion based on energy usage when compared to shed and restore settings. Shedding may be implemented independently on each and every zone or piece of equipment connected to system.
2. Status of each and every load shed program capable of being displayed on every operator terminal connected to system. Status of each load assigned to an individual shed program displayed along with the description of each load.
3. Demand-limiting program monitor building power consumption from signals generated by pulse generator (provided by BAS contractor) mounted at building power meter or from watt transducer or current transformer attached to building feeder lines.
4. Demand-limiting program predicts probable power demand so that when demand exceeds demand limit, action will be taken to reduce loads in predetermined manner. When demand limit will not be exceeded, action will be taken to restore loads in predetermined manner.

- G. Maintenance Management: System monitors equipment status and generate maintenance messages based upon user-designated run-time, starts, and/or calendar date limits. Coordinate settings with Owner.

- H. Sequencing: Provide application software based upon sequences of operation specified to properly sequence designated systems. Provide points to achieve specified sequences.
- I. Staggered Start: This application prevents controlled equipment from simultaneously restarting after a power outage. Order in which equipment (or groups of equipment) is started, along with time delay between starts to be user-selectable.
- J. Energy Calculations: Provide software to allow instantaneous power (e.g. kW) or flow rates (e.g. L/s (gpm)) to be accumulated and converted to energy usage data.
- K. Anti-Short Cycling: Binary output objects protected from short cycling by allowing minimum on-time and off-time to be selected.
- L. On/Off Control with Differential: Provide algorithm that allows binary output to be cycled based on controlled variable and setpoint. Algorithm direct-acting or reverse-acting and incorporate adjustable differential.
- M. Run-Time Totalization: Provide software to totalize run-times for binary input objects.

## 2.5 WEB BASED ACCESS

- A. General Description: BAS supplier to provide web-based access to the system as part of standard installation. Provide access to user of displays of real-time data that are part of the BAS via a standard Web browser. Web browser to tie into the network via Ethernet network connection. Provide web-page host that resides on the BAS network. Web-page software not to require a per user licensing fee or annual fees. The web-page host must be able to support at least 50 simultaneous users with the ability to expand the system to accommodate an unlimited number of users. Software to be manufacturer's most current version at time of installation.
- B. Browser Technology: Browser to be standard version of Microsoft Internet Explorer (latest edition). No special vendor-supplied software needed on computers running browser. Displays viewable and the Web-page host to directly access real-time data from the BAS network. Data displayed in real time and update automatically without user interaction. User able to change data on displays if logged in with the appropriate user name and password.
- C. Display of Data: Web page graphics shown on browser to be replicas of the BAS displays. User to need no additional training to understand information presented on Web pages when compared to what is shown on BAS displays. Web page displays to include animation just as BAS displays. Fans to turn, pilot lights to blink, and coils to change colors, and so on. Real-time data shown on browser Web pages. This data must be directly gathered via the BACnet network and automatically updated on browser Web page displays without any user action. Data on the browser to automatically refresh as changes are detected without re-drawing the complete display. User to be able to change data from browser Web page to if the user is logged on with the appropriate password. Clicking on a button or typing in a new value to change digital data. Using pull-down menus or typing in a new value to change analog data. Data displays navigated using pushbuttons on the displays that

are simply clicked on with the mouse to select a new display. Alternatively, the standard back and forward buttons of the browser can be used for display navigation.

- D. Web Page Generation: Web pages generated automatically from the BAS displays that reside on the BAS server. User to access Web-page host via the network and initiate a web page generation utility that automatically takes the BAS displays and turns them into Web pages. The Web pages generated are automatically installed on the Web page host for access via any computer's standard browser. Any system that requires use of an HTML editor for generation of Web pages will not be considered.
- E. Password Security and Activity Log: Access via Web browser to utilize the same hierarchical security scheme as BAS system. User asked to log in once the browser makes connection to Web-page host. Once the user logs in, any changes that are made to be tracked by the BAS system. User able to change only those items that the user has authority to change. A user activity report to show any activity of the users that have logged in to the system regardless of whether those changes were made using a browser or via the BAS workstation.
- F. Communication: Web-page host to communicate using the specified protocol standard to devices on the BAS network.

## 2.6 BAS GRAPHICS

- A. Develop customized graphics showing the project building(s) and their floor plans, mechanical, and electrical equipment, flow and control diagrams, and other relevant features on Workstation graphic screens. Associated input, output, and virtual objects (e.g., temperature and pressure setpoints) listed in the Sequence of Operation, and shown on the Input/Output Objects List included in the graphic screens and bound to the database. Real-time value of objects updated on the display of each graphic automatically. For projects where existing campus and/or building controls systems exist, replicate graphics used in the existing BAS graphics screens.
- B. Graphics to have links to the Print function and to display a Standard Legend in the corner of the graphic. Graphics, except pop-ups, to have the date and time displayed in the upper corner of the graphic. Each graphic titled.
- C. Weather: Graphics, except pop-ups, to have the outdoor temperature and humidity in the upper corner of the graphic.
- D. Alarms: System and component summary alarms located near the top of each relevant graphic screen. Provide links to the associated system/component as part of these tags to assist trouble shooting. Other alarms placed near the associated system/device as depicted in the graphic. Provide text and color of information tags that describe each object and alarm value consistent with a graphics color legend.
- E. The Following Graphics Provided as a Minimum:
  - 1. A building graphic, typically a photograph of the building, with links to each floor plan and other links as defined below.



2. A central plant graphic with equipment (chillers, boilers, pumps, heat exchangers, storage tanks, etc.), temperature sensors, pressure sensors, flow sensors and refrigeration leak detectors. The central plant graphic to have links to each building on the campus.
  3. Central equipment such as air handler, package rooftop equipment, supply fans, exhaust fans, and smoke control systems.
  4. Floor plans of each floor, with temperature sensors, pressure sensors, temperature control zones, heating/cooling zones, ventilation zones, and supply air zones identified. Rooms grouped on a graphic only to the extent that detailed and complete sensing information can be comfortably viewed by an operator and the bound points updated in less than 10 seconds. Each zone to have a temperature symbol that changes color over the range from low (blue) through normal (green) to high (red) and indicate an alarm (flashing red). The zone temperature and or pressure symbol(s) to be a link to a zone control pop-up graphic. Individual floor plan graphics to provide links to related mechanical systems. The mechanical room plan graphics to show the relative location of, and provide links to, either the equipment pop-up or flow and control graphic for mechanical equipment monitored or controlled by the BAS.
  5. Pop-up graphics provided for each zone control system showing a flow diagram and related monitoring and control points and system parameters. Pop-up graphics provided for each piece of equipment that is not shown on a flow and control graphic.
  6. Flow and control diagrams for each system including but not limited to central plant, fan coils, generators, packaged equipment, chilled water systems, heating hot water systems, heat exchangers, pumps, storage tanks, zone terminal units, isolation room systems, smoke damper status, combination fire and smoke damper status, and ventilation systems. The flow and control graphics to have parameters grouped in the lower portion of the graphics. Standard equipment graphics used. Pumps, fans, dampers and other elements to dynamically indicate their state (i.e. pumps and fans to rotate when on and damper positions to dynamically adjust and be shown in their current position, etc.). System flow and control graphics displayed in a general left to right flow or loop arrangement. Return and exhaust air flow shown on top and return water shown on the bottom of the graphic.
  7. Individual equipment/component screens showing sensing and control information available for each device provided.
- F. Penetration: The graphic interface to consistently apply a convention whereby a left-click to always penetrate to more detailed information. The text windows to represent the deepest level of penetration. A right-click to always produce a menu of options that are specific to the item selected.
- G. Navigation: Graphics organized to provide a "branching structure" that allows an operator to move from a "macro view" to a "micro view" and return. These links to other associated graphics, or allow a return to a previous macro view, provided and

arranged horizontally along the bottom of each graphic screen. From left to right, the graphic links as follows: site/building map, building/trailer floor plans, and major mechanical systems at each building. Pop-up right click menus provided as needed on the lower button bar to allow for uncluttered navigation.

- H. Clutter Minimization: Each graphic to have separate check boxes in the lower right corner that show/hide setpoints, alarms/safeties, and devices/equipment.
- I. Templates: To the maximum extent possible, use standard graphics as templates to provide a consistent look throughout the interface.
- J. Color Scheme: The graphics to use dynamic color changes to communicate equipment type, or object status consistent with the graphics color legend.
- K. Symbols and Animations: Fans, pumps, dampers, coils, and generation equipment to be dynamic symbols indicating rotation, state, or position, movement, flow, etc.
- L. Macros: When macros are used to add functionality to the graphics, detailed documentation provided.
- M. Configure Mode: Access to "Configure Mode" for editing of the graphics password protected to prevent unauthorized changes to the graphics. This password supplied to the appropriate personnel.
- N. Graphics Version: Graphics provided in the most current format available at time of control system programming.
- O. Points and graphics checked for the proper binding and graphic programming, settings to ensure that the correct system, location, point values and dynamics are shown in the proper location and rotate in the proper directions.
- P. After graphics have been accepted, provide, on a CD ROM in an agreed upon file structure. If the graphics have active-x controls or other files that must be placed outside the graphics folder structure a set-up program provided on the disk to place the files in the correct locations.

## 2.7 BUILDING CONTROLLERS

- A. General: Provide adequate number of building controllers to achieve performance specified. Panels to meet the following requirements.
  - 1. Building Automation System (BAS) to be composed of one or more independent, stand-alone, microprocessor-based building controllers to manage global strategies described in Controller Software article.
  - 2. Provide sufficient memory to support operating system, database, and programming requirements.
  - 3. Share data between networked building controllers.



4. Distributed controllers to share real and virtual object information and allow for central monitoring and alarms.
  5. Controllers that perform scheduling have real-time clock.
  6. Continually check status of its processor and memory circuits and if abnormal operation is detected, controller:
    - a. Assume predetermined failure mode.
    - b. Generate alarm notification.
  7. Building Controller communicates with other devices on internetwork including BACnet communications according to specified protocol.
- B. Communication:
1. Each building controller resides on network using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol and performs routing to network of custom application and application specific controllers.
  2. Controller provides a service communication port for connection to a portable operator's terminal.
- C. Environment:
1. Controllers used outdoors and/or in wet ambient conditions mounted within NEMA waterproof enclosures and rated for operation at 0 degrees F to 150 degrees F.
  2. Controllers used in conditioned space are mounted in NEMA dust-proof enclosures and rated for operation at 32 degrees F to 120 degrees F.
- D. Keypad: Local keypad and display to be provided for each controller. Security password to be available to prevent unauthorized use of keypad and display.
- E. Serviceability: Provide diagnostic LEDs for power, communication, and processor. Wiring connections are made to modular terminal strips or to termination card connected by ribbon cable.
- F. Memory: Building controller maintains BIOS and programming information in event of power loss for at least 72 hours.
- G. Immunity to power and noise. Controller able to operate at 90 percent to 110 percent of nominal voltage rating and performs an orderly shutdown below 80 percent nominal voltage. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3-feet.
- H. Controller to have a battery to provide power for orderly shutdown of controller and storage of data in nonvolatile flash memory. Battery backup to maintain real-time clock functions for a minimum of 10 days.

## 2.8 APPLICATION SPECIFIC CONTROLLERS

- A. Application specific controllers (ASCs) are microprocessor-based DDC controllers, which through hardware or firmware design are dedicated to control a specific piece of equipment. Controllers to be fully programmable using graphical programming blocks.
1. ASC controllers communicate with other devices on internetwork.
  2. Each ASC capable of stand-alone operation without being connected to network.
  3. Each ASC will contain sufficient I/O capacity to control target system.
  4. Application controllers to include universal inputs with minimum 10-bit resolution that accept thermistors, 0-10VDC, 0-5 VDC, 4-20 mA and dry contact signals. Any input on a controller may be either analog or digital with at least 1 input that accepts pulses. Controller to also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller to include binary and analog outputs on board. Provide analog outputs switch selectable as either 0-10VDC or 0-20mA. Software to include scaling features for analog outputs. Application controller to include 24VDC voltage supply for use as power supply to external sensors.
  5. Program sequences stored on board application controller in EEPROM. No batteries needed to retain logic program. Program sequences executed by controller 10 times per second and capable of multiple PI and PID loops for control of multiple devices. Calculations completed using floating-point math and system to support display of information in floating-point nomenclature at operator's terminal. Programming of application controller completely modifiable in the field over installed BAS LANs or remotely via modem interface. Operator to program logic sequences by graphically moving function blocks on screen and tying blocks together on screen.
  6. Application controller to include support for room sensor. Display on room sensor programmable at application controller and include an operating mode and a field service mode. Provide button functions and display data programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operation for specific display requirements at intelligent room sensor.
- B. Communication:
1. Controller resides on network using MS/TP Data Link/Physical layer protocol.
  2. Each controller connected to building controller.
  3. Each controller capable of connection to laptop computer or portable operator's tool.
- C. Environment:

1. Controllers used outdoors and/or in wet ambient conditions mounted within NEMA waterproof enclosures and rated for operation at 0 degrees F to 150 degrees F.
  2. Controllers used in conditioned space mounted in NEMA dust-proof enclosures and rated for operation at 32 degrees F to 120 degrees F.
- D. Serviceability: Provide diagnostic LEDs for power, communication, and processor.
- E. Memory: ASC use nonvolatile memory and maintains BIOS and programming information in event of power loss.

## 2.9 APPLICATION SPECIFIC CONTROLLER - TERMINAL UNIT CONTROLLERS

- A. Provide one application controller for each terminal unit that adequately covers objects listed in object list for unit. Controllers to interface to building controller via LAN using specified protocol. Controllers to include on board flow sensor, inputs, outputs and programmable, self-contained logic program as needed for control of units.
- B. Application controllers to include universal inputs with 10-bit resolution that can accept thermistors, 0-5 VDC, and dry contact signals. Inputs on controller may be either analog or digital. Controller to also include support and modifiable programming for interface to intelligent room sensor with digital display (digital display to indicate setpoint only). Controller to also include binary outputs on board. For applications using variable speed parallel fans, provide a single analog output selectable for 0-10 V or 0-20 mA control signals. Application controller to include microprocessor driven flow sensor for use in pressure independent control logic. Terminal units controlled using pressure independent control algorithms and flow readings to be in CFM.
- C. Program sequences stored on board application controller in EEPROM. No batteries needed to retain logic program. Program sequences executed by controller 10 times per second and capable of multiple PI loops for control of multiple devices. Provide programming of application controller completely modifiable in the field over installed specified protocol LANs or remotely via modem interface. Operator to program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller programmed using the same programming tool as Building Controller and as described in Operator Workstation article.
- D. Application controller to include support for intelligent room sensor. Display on room sensor programmable at application controller and include an operating mode and a field service mode. Button functions and display data programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence for specific display requirements for intelligent room sensor.
- E. Provide duct temperature sensor at discharge of each terminal unit that is connected to controller for reporting back to operator workstation. Provide analog inputs for the duct temperatures.

## 2.10 INPUT/OUTPUT INTERFACE

- A. Input/output points protected such that shorting of point to itself, to another point, or to ground will cause no damage to controller. Input and output points protected from voltage up to 24 V.
- B. Binary inputs (BI or DI) allow monitoring of On/Off signals from remote devices. Binary inputs sense “dry contact” closure without external power (other than that provided by controller) being applied.
- C. Pulse accumulation input objects accept up to 10 pulses per second for pulse accumulation.
- D. Analog inputs (AI) allow monitoring of low-voltage (0 to 10 VDC), current (4 to 20 mA), or resistance signals (thermistor, RTD).
- E. Binary outputs (BO or DO) provide for On/Off operation or pulsed low-voltage signal for pulse width modulation control. Binary outputs on building and custom application controllers have three-position (On/Off/Auto) override switches and status lights. Outputs selectable for either normally open or normally closed operation.
- F. Analog outputs (AO) provide a modulating signal for control of end devices. Outputs provide either a 0 to 10 VDC or a 4 to 20 mA signal as required to provide proper control of the output device. Analog outputs on building controllers have status lights and two-position (AUTO/MANUAL) switch and adjustable potentiometer for manual override. Analog outputs not exhibit drift of greater than 0.4 percent of range per year.
- G. Tri-State Outputs. Provide tri-state outputs (two coordinated binary outputs) for control of three-point floating type electronic actuators without feedback. Use of three-point floating devices limited to zone control and terminal unit control applications (VAV terminal units, duct-mounted heating coils, zone dampers, radiation, etc.). Control algorithms run zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.

## 2.11 POWER SUPPLIES AND LINE FILTERING

- A. Control transformers UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in both primary and secondary circuits. Limit connected loads to 80 percent of rated capacity.
- B. DC power supply output match output current and voltage requirements. Unit operates between 32 degrees F and 120 degrees F.
- C. Line voltage units UL listed and CSA approved.
- D. Power line filtering. Provide transient voltage and surge suppression for workstations and controllers.

## 2.12 CONTROL PANELS

- A. Control Panels:

1. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures to be NEMA 12 when installed in other than a clean environment. Outdoor enclosures must be NEMA 3R. Provide (hinged door) key-lock latch and removable subpanels. Single key common to field panels and subpanels. In existing campus or building settings, key lock to match existing keys.
2. Interconnections between internal and face-mounted devices prewired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections UL listed for 600 volt service, individually identified per control/ interlock drawings, with adequate clearance for field wiring. Control terminations for field connection individually identified per control drawings.
3. Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.
4. Provide laminated plastic nameplates for enclosures in any mechanical room or electrical room labeled with TCP number. Laminated plastic to be 1/8-inch thick sized appropriately to make label easy to read.

## 2.13 AUXILIARY CONTROL DEVICES

### A. Temperature Instruments:

1. Low-voltage or Line-voltage Thermostats: Bimetal-actuated, snap acting SPDT contact, enclosed, UL listed for electrical rating, exposed setpoint adjustment on cover with heat anticipator. Thermostat operates within 55 degrees F to 85 degrees F setpoint range, with 2 degrees F maximum differential.
2. Room Temperature Sensors: Thermistor or platinum RTD type with accuracy of plus or minus 0.5 degrees F at 70 degrees F; operating range 30-120 degrees F; linear signal; single point sensing element in wall-mounted ventilated enclosure with insulating back plate if mounted on exterior wall; plug-in portable operators terminal port.
3. Room Temperature Sensor: Thermistor or platinum RTD type with accuracy of plus or minus 0.5 degrees F at 70 degrees F; operating range 30-120 degrees F; linear signal; single point sensing element in wall-mounted ventilated enclosure with insulating back plate if mounted on exterior wall; push button for occupancy override; digital setpoint adjustment plus or minus 2 degrees F in both directions; LCD temperature display indicating setpoint only. Setpoint adjustment to revert to building programmed standard temperature upon next building occupancy schedule change (user adjustable). Room temperature sensor may have integral space carbon dioxide sensor with minimum performance characteristics identified within this specification. Include integral occupancy sensor for public rooms but not in offices.
4. Averaging Duct Temperature Sensors: Thermistor or platinum RTD element with accuracy of plus or minus 0.5 degrees F at 32 degrees F, consisting of array of

single point sensing elements, securely mounted in duct or plenum; operating range 20-120 degrees F; linear signal; 1-foot element per 2 SF of duct cross-sectional area. Use when duct is 9 SF or larger or where air is subject to temperature stratification.

5. Probe Duct Temperature Sensors: Thermistor or platinum RTD element with accuracy of plus or minus 0.5 degrees F at 32 degrees F, consisting of single point sensing elements, securely mounted in duct or plenum; operating range 20-120 degrees F; linear signal; 24-inch rigid probe. Use where duct is less than 9 SF cross-sectional area.
6. Outside Air Temperature Sensor: Thermistor or platinum RTD element with accuracy of plus or minus 0.5 degrees F at 32 degrees F; Range -58 to 120 degrees F, single element, linear, with weather and sun shield for exterior mounting.
7. Low Temperature Limit Thermostat: Minimum 20 foot capillary sensing element, triggering on low temperature as sensed by any 12-inch segment; snap acting, normally open contacts, manual reset, line voltage.
8. Liquid Immersion Temperature Sensor: Thermistor or platinum RTD element, with accuracy of plus or minus 0.5 degrees F at 32 degrees F, stainless steel well and assembly, range 30 to 250 degrees F.
9. Pneumatic Room Thermostat: Two-pipe relay type with concealed adjustment, and no thermometer, blank cover secured with Allen screws.

B. Humidity Sensors:

1. Space Humidity Sensors: Operating range 10 to 95 percent relative humidity, accuracy plus or minus percent RH, surface mounted ventilated enclosure for wall mounting.
2. Duct Humidity Transmitter: Capacitive type sensor and transmitter, linear output signal; automatic temperature compensating; air filter; plus or minus 2 percent RH accuracy from 0 to 100 percent RH.
3. Humidity sensor's drift not exceed 1 percent of full scale per year.

C. Dewpoint Transmitter:

1. Uninterrupted, accurate and stable dewpoint measurement in condensing environments. Provide with integral temperature sensor.
2. Calculate:
  - a. Relative Humidity
  - b. Absolute Humidity
  - c. Difference between ambient and dewpoint temperature.

- d. Mixing Ratio of Air
  - e. Wet Bulb Temperature of Air
  - 3. Provide hand held field calibration.
  - 4. Provide with local display and connection to BAS (analog output signal from device to BAS 4-20 mA signal).
  - 5. Dust and Chemical Resistant
  - 6. NEMA 4 Housing
  - 7. NIST Traceable with Certificate
  - 8. Specifications:
    - a. Dewpoint Measurement Range:-40 degrees F to 212 degrees F
    - b. Response Time: 15 seconds
    - c. Temperature Measurement Range:40 degrees F to 356 degrees F
    - d. Accuracy: 0.18 degrees F
    - e. Typical Ranges:
      - 1) Relative Humidity: 0 to 100 percent
      - 2) Dewpoint Difference: 0 to 90 degrees F
      - 3) Mixing Ration: 0 to 3500 gr/lb
      - 4) Absolute Humidity: 0 to 262 gr/ft<sup>3</sup>
      - 5) Wet Bulb Temperature: 32 degrees F to 212 degrees F
  - 9. Manufacturers:
    - a. Vaisala HMP243 with HMK41 field calibrator.
    - b. Or approved Equivalent.
- D. Pressure Transmitters and Transducers:
- 1. Transducer have linear output signal; field adjustable zero and span. Sensing elements withstand continuous operating conditions of positive or negative pressure 50 percent greater than calibrated span without damage.
  - 2. Differential Pressure Switch: Setpoint adjustable with operating range of 0.5 to 12-inch WG for fans, and 5 to 30-feet WC for pumps. Switches UL listed; SPDT



snap-acting; pilot duty rated (125 VA minimum); NEMA 1 enclosure; scale range and differential suitable for intended application.

3. Filter Differential Pressure Switch: Setpoint adjustable with operating range of 0.1 to 5-inch WG; auto reset. Contactor to close when pressure differential setting is met or exceeded. Provide mounting bracket, metallic tubing and appropriate fittings for connection to duct or air-handling unit.
4. Duct Static Differential Pressure Transducer: Operating range 0 to 5-inch WC for duct mounted transmitter; ceramic capacitive sensing element with probe securely mounted in duct; digital input terminal and push button to zero output. Accuracy plus or minus 1 percent of full scale; maximum response time 2 seconds.
5. Building Static Pressure Transducer: Operating range of -0.1 to 0.1-inch WC, linear signal. Sensing tubes located inside and outside building use shielding and/or surge tanks to minimize effects of wind. Accuracy plus or minus 1 percent of full scale.
6. Piping Pressure Transmitter: Operating range 0 to 50 PSIG, linear signal; stainless steel diaphragm; digital input terminal and push button to zero output. Accuracy plus or minus 1 percent of full scale.

E. Motorized Control Dampers:

1. Performance: Maximum leakage of 3 CFM/SF at 1-inch WG differential pressure, AMCA Class 1A, maximum pressure rating of 13-inch WG differential pressure, maximum velocity of 6,000 fpm, -72 degrees F to 275 degrees F temperature rating.
2. Multi-blade type, except where either dimension is less than 10-inch single blade may be used. Maximum blade length to be 48-inch.
3. Provide parallel blades for modulating mixing service and opposed blades for throttling service.
4. Blades to be interlocking; minimum 16 gauge galvanized steel; compression type edge seals and side seating stops. In copper, aluminum and stainless steel duct work, damper material matches duct work material.
5. Damper blades are reinforced, have continuous full length axle shafts, axle to axle linkage, and/or operating "jackshafts" as required to provide coordinated tracking of blades.
6. Bearings: Self-lubricating stainless steel sleeve or Celcon bearing.
7. Dampers over 25 SF in area to be in two or more sections, with interconnected blades.
8. Provide remote damper blade position status with binary input.



9. Tested in accordance with AMCA Standard No. 500.

F. Motorized Control Valves:

1. Body pressure rating and connection type construction conforms to pipe, fitting and valve schedules.
2. Fluid valve close-off ratings and spring ranges operate at maximum flows and maximum available pump heads scheduled without leakage.
3. Screwed ends except 2-1/2-inch and larger valves with flanged ends.
4. Steam valve close-off ratings operates at 150 percent of steam pressure without leakage.
5. Motorized Control Valves (Pressure Independent Control Valves):
  - a. Description: Valve consists of pressure compensating cartridge, actuated ball or Y pattern globe valve, and multiple pressure/temperature test ports in a single valve housing.
  - b. Construction: Rated for no less than 125 PSI and 250 degrees F. 2-inch and Smaller: brass with threaded connections. 2-1/2-inch and larger: cast iron with flanged connections.
  - c. Performance: Flow rate controlled linearly to within 5 percent of target flow rate, for any actuator position (0 to 100 percent), over an operating differential pressure range of 6 to 50 PSI across the valve. Provide valve with integral test ports to verify pressure differential.
  - d. Manufacturers: Belimo, Danfoss, Flow Control Industries, Griswold, Tour and Andersson or approved equivalent.
6. Fluid three-way valves globe valves with linear plug with composition disc for tight shutoff.
7. Pressure drop equal to twice pressure drop through heat exchanger (load), 50 percent of pressure difference between supply and return mains, or 5 PSI, whichever is greater, except two-position valves to be line size.
8. Bubble-tight line size butterfly valves acceptable on 2-1/2-inch lines and above for two-position action only; cast iron body; aluminum bronze disc; EPDM seat, 200 PSI wg
9. For modulating service that require valve sizes above 6-inch, butterfly or v-port ball valves are allowed.
10. Steam Valves: Body and trim materials in accordance with manufacturer's recommendations for design conditions and service with linear ports for modulating service. Sizing Criteria:

- a. Two-Position Service: Pressure drop 10 percent to 20 percent of inlet PSIG.
- b. Modulating Service: 15 PSIG or less; pressure drop 80 percent of inlet PSIG.
- c. Modulating Service: 16 to 50 PSIG; pressure drop 50 percent of inlet PSIG.
- d. Modulating Service: Over 50 PSIG; pressure drop as scheduled on Drawings.

G. Electric Damper/Valve Actuators:

1. Provide mechanical or electronic stall protection for each actuator.
2. Where indicated provide internal mechanical, spring-return mechanism or provide uninterruptible power supply (UPS). Non-spring-return actuators have external manual gear release to position damper/valve when actuator is not powered.
3. Proportional actuators accepts 0 to 10 VDC or 0 to 20 mA control signal and provide 2 to 10 VDC or 4 to 20 mA operating range.
4. Actuator sized for torque required plus 25 percent; UL or CSA listed; electronic current overload protection.
5. VAV Actuators: Actuators proportional 24 VAC actuators using a 4 to 20 mA range of control signals; stops automatically at end of travel; include permanently lubricated gear train.
6. Actuators for emergency generator damper control rated for 350 degree F. maximum operating temperature and capable to drive fully open and close within 15 seconds.

H. Pneumatic Damper/valve Actuators and Positioners:

1. Pneumatic actuators diaphragm type.
2. Molded or die-cast zinc or aluminum housing; except terminal unit actuator housings for dampers/valves may be of high-impact plastic construction (with metal enclosure when used in return air plenums).
3. Actuator size and spring ranges suitable for intended application; rated for 20 PSIG; separate actuator for each damper section.
4. On sequencing applications, valve/damper actuators sized for 2 PSI maximum shift in nominal spring range and provided with positive positioners.

I. Air Flow Meters:

1. Fan Inlet Type: Self-supporting aluminum traverse probes housing thermal dispersion sensors. Probe spacing and sensor quantity as recommended by manufacturer. Provide factory calibrated electronic flow transmitter with CFM

readout display and capability of providing 4 to 20 milliamp output for interface with direct digital controls. Ebtron GTx116-PC.

2. Fan Inlet Type: Self-supporting traverse probe type velocity pressure averaging station; stainless steel construction for exhaust fans; aluminum construction for air handler units. Provide factory calibrated electronic flow transmitter; CFM readout display; capable of providing 4 to 20 milliamp output. Air Monitor Volu-probe/FI; Paragon; Accutrol.
3. Duct Mounted Air Flow Station: Self-supporting aluminum alloy tube with stainless steel mounting brackets. Probe and sensor density quantity as recommended by manufacturer. Sensor use thermal dispersion technology with two "bead in glass," hermetically sealed thermistor probes at each measuring point. Provide electronic flow transmitter with CFM readout display and capable of 4-20 mA output signal. Ebtron GTA116-PC.

J. Water Flow Meter:

1. Provide a Turbine Flow Meter (reference 23 05 19) complete with installation hardware necessary to enable insertion and removal of the meter without system shutdown. The flow meter hand-insertable up to 400 PSI. The flow meter to have two contra-rotating axial turbines, with electronic impedance-based sensing and an averaging circuit to reduce measurement errors due to swirl and flow profile distortion. Wetted metal components nickel-plated brass. Provide 316L SS construction for hot water applications operating over 250 degrees F, and for any application in non-metallic pipe. The maximum operating temperature 280 degrees F, 300 degrees F peak. Each flow meter individually wet-calibrated against a primary volumetric standard that is accurate to within 0.1 percent and traceable to NIST\*. Manufacturer's certificate of calibration provided with each flow meter. Accuracy within plus or minus 0.5 percent of rate at the calibrated velocity, within plus or minus 1 percent of rate over a 10:1 turndown (3.0 to 30 ft/s) and within plus or minus 2 percent of rate over a 50:1 turndown (from 0.4 to 20 ft/s). The flow meter to include integral analog output(s), 4-20 mA, 0-10V, or 0-5V. Bi-directional meters to include an isolated contact closure output for direction. Flow meter covered by the manufacturer's two year warranty.
2. Retractable insertion vortex flow meter; accuracy plus 1.0 percent of full scale with 30 to 1 turndown capability; flow range 0.5 to 15 fps; analog output; 400 PSI operating pressure with 400 PSI ball valve; stainless steel shedder bar; rate/total display. Hydro-Flow (Emco) Model 3100.

- K. Room Pressure Monitor: Active room pressure monitor and alarm which provides local audio alarm and analog and alarm signals to DDC system. Wall mounted panel with LED differential pressure readout; audible and visual alarm; mute button; range of -0.05 to +0.05-inch WC; accurate to 1 percent of full scale; repeatability plus or minus 1.0 percent of full scale per year, alarm delay ability between 0-30 seconds. Provide door switch to deactivate alarm when space door(s) are open. Input status from BAS to deactivate alarm in unoccupied or shutdown modes. Phoenix Controls APM100.

L. Duct Mounted Carbon Dioxide Sensor:

1. Duct mounted CO<sub>2</sub> sensor consists of infrared sensing element with heated stannic dioxide semiconductor. Operating range 0-2000 ppm plus 50 ppm plus 2 percent of measured value; maximum duct velocity of 1500 fpm; duct mounting kit.

M. Wall Mounted Space Carbon Dioxide Sensor:

1. Sensor to employ non-dispersive infrared technology. (N.D.I.R.)
2. Sensor Repeatability: Plus or minus 20 ppm. 0-2000.
3. Sensor Accuracy: Less than or equal to 75 ppm over 0-1500 ppm range.
4. Sensor Response Time: Less than 1 minute.
5. Sensor to employ reference channel design for long-term stability.
6. Sensor to have field selectable 0-10VDC, or 4-20mA outputs.
7. Sensor power requirement less than 3W.
8. Sensor Input Voltage: 20 to 30VAC/DC.
9. Sensor Operating Temperature Range: 0 degrees C to 50 degrees C.
10. Sensor to have models for wall mounting or duct mounting.
11. Sensor to provide at least a 1-year factory warranty from date of purchase.
12. Sensor to match cover in color and look to temperature sensor.
13. Sensor to have display.
14. Manufacturers:
  - a. Telaire
  - b. Vaisala
  - c. Veris

N. Carbon Monoxide Detector:

1. Microprocessor based CO sensor and controller with fan relay, pilot light indicators; comply with UL Standards 2034; self-supervision activates fan if system detects problems; calibration kit for project.

2. Relay to activate fan at sensing 35 ppm CO after 5 minutes. Minimum fan runtime to be 2-1/2 minutes. Relay to activate alarm at sensing 100 ppm CO after 30 minutes. Vulcain Electrochemical Type (Q1).
- O. Nitrogen Dioxide Detector:
1. Microprocessor based NO<sub>2</sub> sensor and controller with fan relay, pilot light indicators; comply with UL Standards 2034; self-supervision activates fan if system detects problems; calibration kit for project.
  2. Relay to activate fan at sensing 10 PPM NO<sub>2</sub> after 5 minutes. Minimum fan runtime to be 2-1/2 minutes. Relay to activate alarm at sensing 15 PPM NO<sub>2</sub> after 30 minutes. Vulcain Electrochemical Type (Q1).
- P. Occupancy Sensor: Dual technology infrared and ultrasonic sensing device, ceiling or wall mounted, built-in self-adjusting settings, timer settings of 30 seconds to 30 minutes, with manual and automatic modes. Provide multiple devices in parallel when area served is greater than a single device sensing capability. Provide integral power pack, 120 VAC input, 24 VDC output, with manual override switch. Leviton OSC-MOW series.
- Q. Paddle Type Flow Switches: Paddle type switches (water service only) UL listed, SPDT snap-acting with pilot duty rating (125 VA minimum) and have adjustable sensitivity with NEMA 1 enclosure.
- R. Relays:
1. Control relays UL listed plug-in type with dust cover and LED "energized" indicator. Contact rating, configuration, and coil voltage to be suitable for application.
  2. Time delay relays UL listed solid-state plug-in type with adjustable time delay. Delay adjustable plus or minus 200 percent (minimum) from setpoint or as indicated. Contact rating, configuration, and coil voltage to be suitable for application. Provide NEMA 1 enclosure when not installed in local control panel.
- S. Override Timers: Override timers spring-wound line voltage, UL Listed, with contact rating and configuration as required by application. Provide 0-to-6-hour calibrated dial unless otherwise specified. Timer suitable for flush mounting on control panel face and located on local control panels or where shown.
- T. Current Transmitters:
1. AC current transmitters are self-powered, combination split-core current transformer type with built-in rectifier and high-gain servo amplifier with 4 to 20 mA two-wire output. Unit ranges 10 A full scale, with internal zero and span adjustment and plus or minus 1 percent full-scale accuracy at 500 ohm maximum burden.

2. Transmitter meets or exceeds ANSI/ISA S50.1 requirements and UL/CSA recognized.
  3. Unit split-core type for clamp-on installation on existing wiring.
- U. Current Transformers: AC current transformers UL/CSA recognized and completely encased (except for terminals) in approved plastic material; plus or minus 1 percent accuracy at 5 A full-scale.
- V. Voltage Transmitters: AC voltage; self-powered single-loop (two-wire) type; 4 to 20 mA output with zero and span adjustment; UL/CSA recognized at 600 VAC rating and meet or exceed ANSI/ISA S50.1. Ranges include 100 to 130 VAC, 200 to 250 VAC, 250 to 330 VAC, and 400 to 600 VAC full-scale, adjustable, with plus or minus 1 percent full-scale accuracy with 500 ohm maximum burden.
- W. Voltage Transformers: AC voltage transformers UL/CSA recognized, 600 VAC rated; built-in fuse protection; suitable for ambient temperatures of 40 degrees F to 130 degrees F; plus or minus 0.5 percent accuracy at 24 VAC and a 5 VA load.
- X. Power Monitors: Selectable rate pulse output for kWh reading; 4-20 mA output for kW reading; N.O. alarm contact; ability to operate with 5.0 amp current inputs or 0-0.33 volt inputs; plus 1.0 percent full-scale true RMS power accuracy; plus 0.5 Hz, voltage input range 120-600 V, and auto range select; NEMA 1 enclosure. Current transformers having a 0.5 percent FS accuracy, 600 VAC isolation voltage with 0-0.33 V output. If 0-5 A current transformers are provided, a three-phase disconnect/shorting switch assembly is required.
- Y. Overflow Switch: Insertion flow sensor, brass, impeller flow design with analog transmitter unit. Data Industrial Model 220BR.
- Z. Ultrasonic Level Transmitter: Non-contact measuring device for liquid level; distance ranges from 4-feet to 32-feet; fail-safe intelligence with diagnostic feedback for troubleshooting; automatic temperature compensation; 24VDC; accuracy plus 0.15 percent of span in air. Kele LU Series.
- AA. Pressure-Electric (PE) Switches: Metal or neoprene diaphragm actuated; operating pressure rated 0-25 PSIG; calibrated scale setpoint range of 2-18 PSIG minimum; UL listed. Provide one- or two-stage switch action SPDT, DPST, or DPDT, as required by application. Electrically rated for pilot duty service (125 VA minimum) and/or for motor control. Permanent indicating gauge on each pneumatic signal line to PE switches.
- AB. Electric Solenoid Operated Pneumatic (EP) Valve: EP valves three part operation - common, normally open, and normally closed; rated for 25 PSIG when used in control system operation at 20 PSIG or less or rated at 150 PSIG when used in control system operation from 25 to 100 PSIG.
- AC. Electro-Pneumatic (E/P) Transducers: Electronic/pneumatic transducer provides proportional 3 to 15 PSIG output signal from either 4 to 20 mA or 0 to 10 VDC analog control input. E/P transducer equipped with following features:

1. Separate Span and Zero Adjustments
2. Manual Output Adjustments
3. Pressure Gauge Assembly
4. Feedback Loop Control
5. Air Consumption of 0.05 L/s (0.1 scfm) at Mid-Range

AD. Emergency Stop Switch: Red, mushroom type, pull out to operate.

AE. End Switches: Turret head Type SPDT. Schneider Electric/Square D Class 9007, Type C54B2, or equal.

AF. Water Detector: Cast aluminum enclosure with adjustable legs; gold plated probes for water detection; LED for water detection; SPDT alarm contacts; 24 VAC/VDC. Kele WD-1B, or approved equivalent.

AG. Tape Style Water Detector: Adhesive sensor tape with copper fiber electrodes and netted cover; tape integrity self-check feature; 24 VAC/VDC. Manufacturer: Kele WD-2-T, or approved equivalent.

AH. Spot Leak Water Detector: Polymer coated sensing probes; adjustable height; 24 VAC/VDC. Manufacturer: Kele SD-R01, or approved equivalent.

AI. Condensation Sensor:

1. Passive condensation sensor which will reliably and instantly indicate that condensation is occurring.
2. Sensor to be able to indicate condensation prior to the condensation being visually perceptible and to last as long as any trace of condensation remains on the surface.
3. Manufactured specifically for radiant cooling applications.
4. Not dependent on dew point, humidity, or temperature determinations.
5. Specifications (Based on Condenser):
  - a. Mounting:
    - 1) The Model C condenser is mounted via its #8-32 x 3/8-inch non-metallic stud, nut and washer.
    - 2) A Pipe Adapter (Model PA-3) is available for mounting any condenser to a 1/8-inch to 3-inch OD pipe.
  - b. Dimensions: Model C - Nom. 1.1-inch square footprint X 0.8-inch H from the mounting surface.



- c. Connection: Its 3 foot long cable is terminated in a MONO audio phone plug (1/8-inch / 3.5 mm for the Model C). Provide extensions to suit field conditions.
  - d. Operating Temperatures: 5 to 70 degrees C.
  - e. Humidity: Not a factor.
  - f. Contaminants: Inert to materials other than plastic solvents. If it becomes contaminated with dust or other debris, typically, it is easily cleaned by flushing it with alcohol to restore it to service. Require no calibration.
  - g. Provide circuit module to provide binary input to the EMS/BAS with a "SENSOR FAULT."
6. Manufacturers:
- a. Model CG-ICM, no known equal.
  - b. Or approved equivalent.

AJ. Wind Speed Sensor:

- 1. Low starting threshold.
- 2. Solid state light source and electronics.
- 3. Low profile to minimize "Sensor Turbulence."
- 4. Calibrated to NIST secondary standard.
- 5. Quick-disconnect connector.
- 6. Internal heater for long bearing life.
- 7. Built-in electrical field surge protection.
- 8. Performance Characteristics:
  - a. Maximum Operating Range: 0-125 mph (0-60 m/s).
  - b. Starting Speed: 0.5 mph (0.22 m/s).
  - c. Calibrated Range: 0-99 mph (0-50 m/s).
  - d. Accuracy: Plus or minus 1 percent (0.15 mph).
  - e. Temperature Range: -50 degrees C to 67 degrees C.
  - f. Response: Distant constant less than 5-feet of flow.



9. Electrical Characteristics:
  - a. Power Requirements: 12 VDC at 10 mA.
  - b. Output Signal: 11 volt pulse.
  - c. Output Impedance: 100 ohms maximum.
10. Physical Characteristics:
  - a. Weight: 1.5 pounds (.68 kilogram).
  - b. Finish: Anodized Aluminum.
  - c. Mounting Fixtures: PN 191 Crossarm Assembly.
11. Accessories:
  - a. PN 1953 Cable Assembly, vinyl jacketed shielded cable.
  - b. Aluminum Cup Assembly, distance constant - 15-feet.
12. Manufacturers:
  - a. Met One Instruments, Inc. - 010C
  - b. Nova Lynx
  - c. Or approved equivalent

AK. Wind Direction Sensor:

1. Airfoil shaped polyurethane van assembly.
2. Components: Stainless steel.
3. Electrical Components: Field replaceable without requiring recalibration.
4. Single potentiometer for either 360 degree or 540 degree applications.
5. Low profile to minimize sensor turbulence.
6. High damping ratio.
7. Short relay distance.
8. Orientation lock.
9. Quick disconnect connector.
10. Internal heater for long bearing life.

11. Wind direction translator module.
12. Electrical field surge protection.
13. Performance Characteristics:
  - a. Azimuth: Electrical - 0-357 degrees
  - b. Azimuth: Mechanical - 0-360 degrees
  - c. Threshold: 0.5 mph
  - d. Linearity: Plus or minus 1/2 percent of full scale
  - e. Damping ratio: 0.25
  - f. Delay distance: Less than 3-feet.
  - g. Accuracy: Plus or minus 3 degrees
  - h. Temperature Range: -50 degrees C to 65 degrees C
14. Electrical Characteristics:
  - a. Power Requirements: 12 VDC at 10 mA, 12 VDC at 350 mA for heater
  - b. Output Signal: 0-5V volt
  - c. Output Impedance: 100 ohms maximum
15. Physical Characteristics:
  - a. Weight: 1.5 pounds (.68 kilogram)
  - b. Finish: Anodized Aluminum
  - c. Mounting Fixtures: PN 191 Crossarm Assembly
16. Accessories: PN 1953 Cable Assembly, vinyl jacketed shielded cable.
17. Manufacturers:
  - a. Met One Instruments, Inc. - 010C
  - b. Nova Lynx.
  - c. Or approved equivalent.

AL. Rain Sensor:

1. Sensor is to be used to detect the onset of rainfall. A gold plated grid sensor activates the circuit when water is deposited onto the grid. The presence of water activates an internal relay that may be used in a Building Automation System.
2. An internal heater constantly dries the grid to prevent relay activation during times of dew, fog, or light moisture that is not actual precipitation. During periods of normal precipitation the heater is unable to dry the grid and the relay is activated. The heater power may be disconnected allowing the detector to be operated as a leaf wetness sensor.
3. The solid state electronics are mounted in a sealed weatherproof enclosure. The precipitation detector may be tilted to allow water to drain off. A mounting bracket is provided with the sensor to allow mounting onto a 1-inch pipe by a U-bolt. The wind screen must be used to prevent premature drying of the grid during precipitation events accompanied by high winds.
4. The unit requires plus 12 Vdc power for operation. A 115 Vac power adapter is provided with each unit. Power adapters for voltages other than 115 Vac are available upon request.
5. Specifications:
  - a. Sensor: Gold plated grid 4-inch diameter.
  - b. Output: Relay (0.5 amps).
  - c. Heater: Resistive element.
  - d. Power: 12 Vdc (235 mA max.) 115 Vac 60 Hz adapter supplied.
  - e. Size: Overall 4-inch diameter x 2-inch high.
  - f. Weight/Shipping: 4 lbs/5 lbs (1.8 Kg/2.3 Kg).
6. Manufacturers:
  - a. NovaLynx Model 260-2590 Precipitation Detector
  - b. Or approved equivalent.

## 2.14 WIRING AND RACEWAYS

- A. General: Provide copper wiring, plenum cable, and raceways as specified in applicable Sections of Division 26, Electrical.
- B. Insulated wire to be copper conductors, UL labeled for 90 degrees C minimum service.
- C. Field panels and controllers to be supplied by building emergency power system where systems being monitored or controlled are on emergency power.

- D. Run control wiring as follows:
  - 1. Mechanical Rooms: In conduit.
  - 2. Exposed in Building Spaces: In conduit.
  - 3. Concealed in Building Walls and Ceilings: Plenum rated cable.
  - 4. Concealed in Building Ceilings: Plenum rated cable in cable tray.
- E. Field and Subfield Panels: Voltage in panels not-to-exceed 120 volts.
- F. Motor Control Centers: Responsibility for correct voltage of holding coils and starter wiring in pre-wired motor control centers interfacing with automatic controls is included hereunder.
- G. Wiring for BAS systems communications buses two conductor minimum 18 gauge foil-shielded, stranded twisted pair cable rated at 300 VDC or more than 80 degrees C.

## 2.15 SMOKE DETECTION (FOR PROJECTS WITH A FIRE ALARM SYSTEM)

- A. See Division 28 for Products.

## **PART 3 - EXECUTION**

### 3.1 DEMOLITION

- A. Terminal Devices: Remove terminal sensors, actuators and controls as indicated on drawings and as required to accommodate scope of mechanical work shown on drawings and described in specifications. Remove pneumatic piping and cap with hardware as appropriate. Remove wiring and conduit associated with devices. Do not leave any unused abandoned piping or wiring in space.
- B. Graphics and Programming: Remove symbols from control system graphics associated with deleted terminal elements. Modify programming code to delete alarms, control loops, etc., associated with deleted terminal devices.

### 3.2 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.
- B. Notify the Owners' representative in writing of conditions detrimental to the proper and timely completion of the work.
- C. Do not begin work until unsatisfactory conditions are resolved.

### 3.3 CONTROL SYSTEM CHECKOUT AND TESTING

- A. Testing completed before Owner's representative is notified of system demonstration.
- B. Calibrate and prepare for service of instruments, controls, and accessory equipment furnished under this specification.
- C. Verify that control wiring is properly connected and free of shorts and ground faults.
- D. Enable control systems and verify calibration and operation of input and output devices.
- E. Verify that system operation adheres to sequences of operation.
- F. Commissioning and Verification: In addition to commissioning requirements specified elsewhere, provide the following commissioning on the HVAC instrumentation and controls system:
  - 1. Control systems completely commissioned to ensure aspects of the system are operating as intended and at optimum tuning.
  - 2. Wiring connections verified and traced from field device to panel to ensure proper connections.
  - 3. Measured values verified by a hand held calibrated device to validate that value indicated by the control system is in fact the actual measured value.
  - 4. Loops properly tuned to obtain the desired control value. Each loop to be "upset" and put back in control to demonstrate its ability to stabilize quickly.
  - 5. Provide a final point-by-point report submitted that indicates the date of each verification, the results, and initialed on each page by the person performing the reading.

### 3.4 ACCEPTANCE TESTING AND TRAINING

- A. Site Testing:
  - 1. Contractor provides personnel, equipment, instrumentation, and supplies necessary to perform testing. Owner or Owner's representative will witness and sign off on acceptance testing.
  - 2. Contractor demonstrates compliance of completed control system with Contract Documents. Using approved test plan, physical and functional requirements of project demonstrated.
- B. Training:
  - 1. General: Contractor conducts training courses for up to three other designated personnel in operation and maintenance of system. Training manuals provided for each trainee, with two additional copies provided for archival at project site.

Manuals include detailed description of subject matter for each lesson. Copies of audiovisuals delivered to Owner. Training day is defined as 8 hours of classroom instruction, including two 15-minute breaks and excluding lunch time, Monday through Friday, during normal first shift in effect at training facility. Notification of any planned training given to Owner's representative at least 15 days prior to training.

2. Operator's Training I: First course taught at supplier's facility for period of one training day. Upon completion, each student should be able to perform elementary operations with guidance and describe general hardware architecture and functionality of system.
3. Operator's Training II: Second course taught at project site for a period of one training day after completion of contractor's field testing. Course includes instruction on specific hardware configuration of installed system and specific instructions for operating installed system. Upon completion, each student should be able to start system, operate the system, recover system after failure, and describe specific hardware architecture and operation of system.
4. Operator's Training III: Third course taught at project site for period of one training day no later than six months after completion of the acceptance test. Course will be structured to address specific topics that students need to discuss and to answer questions concerning operation of system. Upon completion, students should be fully proficient in system operation and have no unanswered questions regarding operation of installed system.

### 3.5 WIRING

- A. Provide electrical wiring required to control systems specified in this Section. Control and interlock wiring complies with national, state and local electrical codes and Division 26, Electrical of this specification.
- B. Power wiring required for building control panel(s) to be dedicated circuit(s).
- C. Verify location of operator work station with Owner prior to installation.
- D. NEC Class 1 (line voltage) wiring UL Listed in approved raceway according to NEC and Division 26, Electrical requirements.
- E. Low-voltage wiring meets NEC Class 2 requirements. (Low-voltage power circuits subfused when required to meet Class 2 current limit.)
- F. Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling return air plenums, approved cables not in raceway may be used provided that cables are UL listed for intended application.
- G. Do not install Class 2 wiring in raceway containing Class 1 wiring. Boxes and panels containing high-voltage wiring and equipment may not be used for low-voltage wiring except for purpose of interfacing (e.g., relays and transformers).

- H. Where Class 2 wiring is run exposed, wiring run parallel along surface or perpendicular to it and tied at 10 foot intervals.
- I. Where plenum cables are used without raceway, support from structural members. Do not support cables with ductwork, electrical raceways, piping, or ceiling suspension systems.
- J. Make wire-to-device connections at terminal block or terminal strip. Make wire-to-wire connections at terminal block.
- K. Maximum allowable voltage for control wiring 24 V. If only higher voltages are available, provide step-down transformers.
- L. Wiring installed as continuous lengths, with no splices permitted between termination points.
- M. Install plenum wiring in sleeves where it passes through walls and floors. Maintain fire rating at penetrations.
- N. Include one pull string in each raceway 1-inch or larger.
- O. Control and status relays are to be located in designated enclosures. Enclosures include packaged equipment control panels unless they also contain Class 1 starters.
- P. Install raceway to maintain a minimum clearance of 6-inches from high-temperature equipment (e.g., steam pipes or flues).
- Q. Secure raceways with raceway clamps fastened to structure and spaced according to code requirements. Raceways and pull boxes may not be hung on flexible duct strap or tie rods. Raceways may not be run on or attached to ductwork.
- R. Install insulated bushings on raceway ends and openings to enclosures. Seal top end of vertical raceways.
- S. Flexible metal raceways and liquid-tight, flexible metal raceways not-to-exceed 3-feet in length and be supported at each end. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal raceways to be used.
- T. Raceway must be rigidly installed, adequately supported, properly reamed at both ends, and left clean and free of obstructions. Raceway sections joined with couplings. Terminations made with fittings at boxes.
- U. Input and output terminations to be labeled at the controller to identify if they are AI, DI, AD, DO, and function (i.e. pump start, OM Sensor).

### 3.6 COMMUNICATION WIRING

- A. Follow manufacturer's installation recommendations for communication cabling.
- B. Verify integrity of network following cable installation.

- C. Communication wiring unspliced length when that length is commercially available; labeled to indicate origination and destination data.
- D. Grounding of coaxial cable in accordance with NEC regulations article on "Communications Circuits, Cable, and Protector Grounding."

### 3.7 INSTALLATION OF AUXILIARY CONTROL DEVICES

#### A. General:

- 1. Install sensors and thermostats in accordance with manufacturer's recommendations.
- 2. Room sensors and thermostats installed at 48-inches AFF to midline of sensor on concealed junction boxes properly supported by wall framing at the locations shown on the Drawings.
- 3. Low-limit sensors used in mixing plenums installed in a serpentine manner horizontally across duct.
- 4. Pipe-mounted temperature sensors installed in wells with heat-conducting fluid in thermal wells.
- 5. Install outdoor air temperature sensors on north facing wall or screen, complete with sun shield at designated location.

#### B. Flow Switch: Use correct paddle for pipe diameter. Adjust flow switch in accordance with manufacturer's instructions.

#### C. Actuators:

##### 1. General:

- a. Mount and link control damper actuators according to manufacturer's instructions.
- b. Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.

##### 2. Actuator Mounting for Damper and Valve Arrangements to Comply with the Following:

- a. Damper Actuators: Do not install in the air stream.
- b. Use a weather proof enclosure (clear and see through) if actuators are located outside.
- c. Damper or valve actuator ambient temperature not-to-exceed 122 degrees F through any combination of medium temperature or surrounding air. Provide



appropriate air gaps, thermal isolation washers or spacers, standoff legs, or insulation as necessary. Mount per manufacturer's recommendations.

- d. Actuator cords or conduit to incorporate a drip leg if condensation is possible. Do not allow water to contact actuator or internal parts. Location of conduits in temperatures dropping below dew point to be avoided to prevent water from condensing in conduit and running into actuator.
  - e. Damper mounting arrangements to comply with the following:
    - 1) Furnish and install damper channel supports and sheet metal collars.
    - 2) Jack shafting of damper sections not allowed.
    - 3) Multi-section dampers arranged so that each damper section operates individually. Provide one electronic actuator direct shaft mounted per section.
  - f. Size damper sections based on actuator manufacturers specific recommendations for face velocity, differential pressure and damper type. In general: Damper section not-to-exceed 24 ft-sq. with face velocity 1500 FPM.
  - g. Multiple section dampers of two or more arranged to allow actuators to be direct shaft mounted on the outside of the duct.
  - h. Multiple section dampers of three or more sections wide arranged with a 3-sided vertical channel (8-inch wide by 6-inch deep) within the duct or fan housing and between adjacent damper sections. Vertical channel anchored at the top and bottom to the fan housing or building structure for support. Connect sides of each damper frame to the channels. Holes in the channel to allow damper drive blade shafts to pass through channel for direct shaft mounting of actuators. Face open side of channel downstream of the airflow, except for exhaust air dampers.
  - i. Multiple section dampers to be mounted flush within a wall or housing opening to receive either vertical channel supports as described above or sheet metal standout collars. Sheet metal collars (12-inch minimum) to bring each damper section out of the wall to allow direct shaft mounting of the actuator on the side of the collar.
3. Pneumatic Actuators:
- a. Size pneumatic damper actuator to operate related control damper(s) with sufficient reserve power to provide smooth modulating action or two-position action. Actuator also sized for proper speed of response at velocity and pressure conditions to which control damper is subject.
  - b. Pneumatic damper actuators produce sufficient torque to close off against maximum system pressures encountered.

- c. Where two or more pneumatic damper actuators are installed for interrelated operation in unison, provide dampers with positive pilot positioner. Positive pilot positioner directly mounted to pneumatic damper actuator and have pressure gauges for supply input and output pressures.
- d. Total damper area operated by actuator not-to-exceed manufacturer's maximum area rating. Provide at least one actuator for each damper section. Each damper actuator not to power more than 20-feet of damper.
- e. Use line shafting or shaft couplings (jackshafting) in lieu of blade-to-blade linkages or shaft coupling when driving axially aligned damper sections.

D. Control Valve:

- 1. Valves installed in accordance with manufacturer's recommendations.
- 2. Slip-stem control valves installed so that stem position is not more than 60 degrees from vertical up position. Ball type control valves installed with stem in horizontal position.
- 3. Control valves accessible and serviceable.
- 4. Install isolation valves so that control valve may be serviced without draining supply/return side piping system. Install unions at connections to screw-type control valves.
- 5. Valve Sizing for Water Coil:
  - a. On/Off Control Valves: Line size.
  - b. Modulating control valve body size may be reduced, at most, two pipe sizes from the line size or not less than 1/2 the pipe size. BAS contractor to size water coil control valves for the application as follows:
    - 1) Booster-heat valves sized not-to-exceed 4-9 PSI differential pressure. Size valve for 50 percent valve authority. Valve design pressure drop is equal to the sum of coil drop plus the balance valve drop.
    - 2) Primary valves sized not-to-exceed 5-15 PSI differential pressure. Size valve for 50 percent valve authority. Valve design pressure drop is equal to the sum of coil drop plus the balance valve drop.
    - 3) Butterfly valves sized for modulating service at 60 to 70 degree rotation. Design velocity 12-feet per second or less when used with standard EPDM seats.
  - c. Valve Mounting Arrangements to Comply with the Following:
    - 1) Provide unions on ports of two-way and three-way valves.

- 2) Install three-way equal percentage Characterized Control valves in a mixing configuration with the "A" port piped to the coil.
- 3) Install 2-1/2-inch and above, three-way globe valves, as manufactured for mixing or diverting service to the coil.

E. Control Damper:

1. Dampers installed in accordance with manufacturer's instructions. Unless specifically designed for vertical blade application, dampers must be mounted with blade axis horizontal.
2. After installation of low-leakage dampers with seals, caulk between frame and duct or opening to prevent leakage around perimeter of damper.

F. Air Flow Station: Install where indicated in ductwork and/or equipment with manufacturer's recommended straight ductwork upstream and downstream of air flow station or as shown on drawings, whichever is greater. Where equipment manufacturer's standard airflow measuring station cannot read airflows at required design velocities, provide appropriate air flow measuring station to provide accurate reading throughout system design operations range.

### 3.8 WATER DETECTOR

- A. Mount by applying a silicone adhesive to the mounting feet. For more permanent installations, fasten the sensor using the 0.19-inch holes provided in the mounting feet with #6 or #8 screws.
- B. Mount adjacent to area to be protected. Unroll the sensor tape, remove vinyl release layer from the back, and hand press onto surface that is dry and free of debris and dust.
  1. Note 1: Once the sensor is activated (wet), the contacts will remain in alarm until the netted cover is completely dry.
  2. Note 2: To convert the tape integrity check relay to a second alarm relay, remove the jumper in the lower right corner of the circuit board. If the sensing tape is not used, install the jumper labeled "NO TBL CHK."
- C. Mount by screwing or gluing to the floor or baseboard.

### 3.9 SMOKE DETECTION (FOR PROJECTS WITH A FIRE ALARM SYSTEM)

- A. Smoke detector furnished and powered/wired under Division 28, Electronic Safety and Security. Coordinate with fire alarm equipment supplier. Installation of duct smoke detector housing and sampling tube under Division 23, HVAC.
- B. Install smoke detectors in return air systems greater than 2000 CFM.
- C. Install smoke detectors at each story prior to connection to return air riser in systems greater than 15,000 CFM and serving more than one story.

### 3.10 SEQUENCES OF OPERATION AND POINTS LISTS

- A. Where local energy code dictates certain sequences (such as night setback, night flush, pressure and temperature reset, terminal unit sequences, etc.), the sequences are not necessarily repeated in the documents. It is not the intent of this specification or documentation to reiterate the energy code. Provide energy code mandated sequences and document in sequence of operations submittals at no additional cost to the Owner. Provide required points to achieve the appropriate sequences.
- B. See control diagrams and sequences on drawings .
- C. When any type of air distribution equipment is not in operation, control devices to remain in their "off" positions. "Off" positions may differ from the "normal" (meaning failed) position. Except as specified otherwise, "off" and "normal" positions of control devices to be as follows:

Device	"Off" Position	"Normal" Position
Heating and Chilled Water Coil Valves	closed	open
Outside Air Damper	closed	closed
Return Air Damper	open	open
Exhaust/Relief Air Damper	closed	closed
Fire and Smoke Dampers	closed	open

- D. Variable Frequency Drives: For a VFD dependent on an external input for its output setting (e.g., the VFD gets "Frequency" as an input), loss of that external input to result in the VFD holding its last value. If the VFD is running its own PID loop and the external input to the VFD is a setpoint (e.g. duct static pressure setpoint), the VFD to hold the last setpoint. If the VFD loses its process variable (e.g. duct static pressure), the VFD to go to its minimum speed setting.
- E. Except as specified otherwise, throttling ranges, proportional bands, and cycle differentials to be centered on the associated setpoint. Modulating feedback control loops to include the capability of having proportional, integral, and derivative action. Unless the loop is specified "proportional only" or "P+I", Contractor to apply appropriate elements of integral and derivative gain to each control loop to result in stable operation, minimum settling time and maintain the primary variable within the specified maximum allowable variance.
- F. Provide a real time clock and schedule controller with sufficient scheduling capability to schedule required controllers and sequences. Schedule functionality may reside in a controller. If a controller is used, document scheduling functionality including names and types on controller points list submittal. Set up initial schedules in coordination with Owner.
- G. Scheduling Terminology: When air handlers are scheduled throughout the day, the following defines the terminology used:

1. Occupied Period: Period of time when the building is in use and occupied. Confirm schedule with Owner. Exclude all national holidays. Generally systems will be fully operational throughout this period and ventilation air to be continuously introduced. Space temperature setpoints will generally be in the "normal" range of 68 degrees to 78 degrees F.
  2. Unoccupied period: Period of time when the building or zone is not in use and unoccupied. Ventilation air not to be introduced.
  3. Preoccupancy Period: Time prior to the Occupied period when the systems are returning the space temperatures from setback to "normal" or occupied setpoints (warm-up and cool-down). Ventilation air shall not be introduced unless outside air conditions permit free-cooling or to support a pre-occupancy purge sequence. Time period to be determined by an optimum start strategy unless otherwise specified.
  4. Setback Period: Setback will typically start with the end of the occupied period and end with the start of the preoccupancy period, however it shall be provided with its own schedule. Generally systems will be off except to maintain a "setback" temperature, economization may be enabled to maintain "setback" cooling setpoint when applicable.
- H. Where any sequence or occupancy schedule calls for more than one motorized unit to start simultaneously, the BAS start commands to be staggered by 5 second (adj.) intervals to minimize inrush current.
- I. Wherever a value is indicated as adjustable (adj.), it shall be modifiable, with the proper password level. For these points, it is unacceptable to have to modify programming statements to change the setpoint.
- J. When a power failure is detected in any phase, the BAS start commands to be retracted immediately from electrically powered units served by the failed power source. If the associated controller is powered by normal or emergency power, it may monitor its own power source as an indication of power status. If the controller is powered by uninterruptible power supply (UPS), or if it is not capable of monitoring its own power for use in sequences, provide at least one voltage monitor (three phase when applicable) per building. When the BAS detects that normal or emergency power has been restored, all equipment for which the BAS start command had been retracted to be automatically restarted in an orderly manner on staggered 5 second intervals to minimize inrush current.
- K. Where reset action is specified in a sequence of operation, but a reset schedule is not indicated on the drawings, employ one of the following methods:
1. Determine a fixed reset schedule to result in stable operation and maintain the primary variable within the specified maximum allowable variance.
  2. Use a floating reset algorithm which increments the secondary variable setpoint (setpoint of control loop being reset) on a periodic basis to maintain primary

variable setpoint. The recalculation time and reset increment to be chosen to maintain the primary variable within the specified maximum allowable variance.

3. Primary variable to control the devices directly using a PID feedback control loop without resetting the secondary variable. However, the control devices to still modulate as necessary to maintain upper and lower limits on the secondary variable. Proportional band, integral gain, and derivative term to be selected to maintain the primary variable within the specified maximum allowable tolerance while minimizing overshoot and settling time. Gain prior approval for implementing this method of reset.
- L. Where a supply air temperature or duct pressure setpoint is specified to be reset by the space temperature of the zones calling for the most cooling/heating, employ the following method:
1. Use a floating reset algorithm which increments the secondary variable (e.g., supply air temperature or duct pressure) setpoint on a periodic basis to maintain primary variable (e.g., space temperature) setpoint. The reset increment to be determined by the quantity of "need heat" or "need cool" requests from individual SCU's. A SCU's "need heat" virtual point to activate whenever the zone's space temperature falls below the currently applicable (occupied or unoccupied) heating setpoint throttling range. A SCU's "need cool" virtual point to activate whenever the zone's space temperature rises above the currently applicable (occupied, unoccupied, or economy) cooling setpoint throttling range. The recalculation time and reset increment to be chosen to maintain the primary variable within the specified maximum allowable variance while minimizing overshoot and settling time. Reset range maximum and minimum values to limit the setpoint range.
- M. Where a supply air temperature, duct pressure, or differential water pressure setpoint is specified to be reset by valve or damper position of the zone or zones calling for the most cooling/heating, the following method to be employed:
1. A floating reset algorithm to be used which increments the secondary variable (e.g., supply air temperature, pipe or duct pressure) setpoint on a periodic basis to maintain primary variable (e.g., cooling valve, heating valve, damper position) setpoint of 85 percent open. The reset increment to be calculated based on the average position of the quantity of the worst (most open valve/damper) zone(s) as specified. The recalculation time, reset increment and control device position influence to be chosen to maintain the primal variable within the specified maximum allowable variance while overshoot and settling time. The BAS analog output value to be acceptable as indicating the position of the control device.
  2. Alternatively to continuously calculating the average of the quantity of worst valve/damper positions, a method similar to the one described above may be employed whereby the "need heat" or "need cool" virtual point to increment by one unit each time a zone's valve/damper position rises to greater than 95 percent. The quantity of "need heat" or "need cool" points to then be the basis for reset.

- N. Where “prove operation” of a device (generally controlled by a digital output) is indicated in the sequence, it shall require that the BAS, after an adjustable time delay after the device is commanded to operate (feedback delay), confirm that the device is operational via the status input. If the status point does not confirm operation after the time delay or anytime thereafter for an adjustable time delay (debounce delay) while the device is commanded to run, an alarm to be enunciated audibly. Upon failure, run command to be removed and the device to be locked out until the alarm is manually acknowledged unless specified otherwise.
- O. BAS to provide for adjustable maximum rates of change for increasing and decreasing output from the following analog output points:
  - 1. Speed control of variable speed drives
  - 2. Control Reset Loop
  - 3. Valve Travel Limit
- P. Wherever a value is indicated to be dependent on another value (i.e., setpoint plus 5 degrees F) BAS to use that equation to determine the value. Simply providing a virtual point that the operator must set is unacceptable. In this case three virtual points to be provided. One to store the parameter (5 degrees F), one to store the setpoint, and one to store the value which is the result of the equation.
- Q. Trend points as identified in the points list. Trends to be grouped system specific and setup in two-axis (x,y) graphical format that display object values relative to time. Setup trends to record data in 5 minute increments.

**END OF SECTION**



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**SECTION 23 21 13**

**HVAC PIPING**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Refrigerant Piping

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, provide:

1. Welding Certificates: Copies of certificates for welding procedures and personnel.
2. Field Test Reports: Written reports of tests specified in Part 3 of this Section. Include the following:
  - a. Test procedures used.
  - b. Test results that comply with requirements.
  - c. Failed test results and corrective action taken to achieve requirements.
3. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at project site.
4. Buried piping manufacturer to submit thrust block (chilled water) and anchor plate (heating hot water) layout and details including anchorage and seismic calculations.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.



B. In addition, meet the following:

1. Installer Qualifications: Company specializing in performing work of the type specified in this Section , with documented experience.
2. Welder Qualifications: Certify in accordance with ASME (BPV IX).
3. ASME Compliance: Comply with ASME B31.9 "Building Services Piping" for materials, products, and installation. Provide safety valves and pressure vessels with the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 01.
4. Refrigerant Piping:
  - a. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX "Welding and Brazing Qualifications."
  - b. ASHRAE Standard: Comply with ASHRAE 15, "Safety Code for Mechanical Refrigeration."
  - c. ASME Standard: comply with ASME B31.5, "Refrigeration Piping."
  - d. UL Standard: Provide products complying with UL 207, "Refrigerant-Containing Components and Accessories, Nonelectrical" or UL 429 "Electrically Operated Valves."

1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements, General Requirements.

**PART 2 - PRODUCTS**

2.1 REFRIGERANT PIPING

A. Piping:

1. Copper Tube: ASTM B 280, Type ACR, drawn-temper tube, clean, dry and capped.
  - a. Fittings: ASME B16.22 wrought copper.
  - b. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy (15 percent Silver).
2. Copper Tube to 5/8-inch OD: ASTM B280. Tube ACR, annealed-temper copper tube, clean, dry and capped.
  - a. Fittings: ASME B16.26 cast copper.
  - b. Joints: Flared.

B. Moisture and Liquid Indicators:

1. Manufacturers:

- a. Henry Technologies.
- b. Parker Hannifin/Refrigeration and Air Conditioning.
- c. Sporlan Valve Company.
- d. Substitutions: See Section 23 00 00, HVAC Basic Requirements, Division 00, Procurement and Contracting Requirements and Division 01, General Requirements requirements.

2. Indicators: Single port type, UL listed, with copper or brass body, flared or solder ends, sight glass, color coded paper moisture indicator and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 300 PSI.

C. Valves:

1. Manufacturers:

- a. Hansen Technologies Corporation.
- b. Henry Technologies.
- c. Danfoss Flomatic.
- d. Substitutions: See Section 23 00 00, HVAC Basic Requirements, Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

2. Packaged Ball Valves:

- a. Two piece bolted forged brass body with Teflon ball seals and copper tube extensions, brass seal cap, chrome plated ball, stem with neoprene ring stem seals; for maximum working pressure of and maximum temperature of 300 degrees F.

D. Filter-Driers:

1. Manufacturers:

- a. Flow Controls Division of Emerson Electric.
- b. Parker Hannifin/Refrigeration and Air Conditioning.
- c. Sporlan Valve Company.
- d. Substitutions: See Section 23 00 00, HVAC Basic Requirements, Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

2. Performance:
  - a. Flow Capacity - Liquid Line: As required by equipment manufacturer, rated in accordance with ARI 710.
  - b. Flow Capacity - Suction Line: As required by equipment manufacturer, rated in accordance with ARI 730.
  - c. Water Capacity: As recommended by equipment manufacturer, rated in accordance with ARI 710.
  - d. Pressure Drop: No greater than maximum recommended by equipment manufacturer, when operating at full connected evaporator capacity.
  - e. Design Working Pressure: 350 PSI, maximum.
3. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, and filtration to 40 microns; of construction that will not pass into refrigerant lines.
4. Construction: UL listed.
  - a. Replaceable Core Type: Steel shell with removable cap.
  - b. Sealed Type: Copper shell.
  - c. Connections: As specified for applicable pipe type.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install per manufacturer's written instructions and requirements.
- B. Preparation:
  1. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
  2. Remove scale and dirt on inside and outside before assembly.
  3. Prepare piping connections to equipment with flanges or unions.
  4. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- C. Field Quality Control:
  1. Leave joints, including welds, uninsulated and exposed for examination during test.
  2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.

3. Flush system with clean water. Clean strainers.
4. Isolate equipment from piping. If a valve is used to isolate equipment, provide closure capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
6. Perform the following tests on hydronic piping:
  - a. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
  - b. While filling system, use vents installed at high points of system to release trapped air. Use drains installed at low points for complete draining of liquid.
  - c. Check expansion tanks to determine that they are not air bound and that system is full of water.
  - d. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the design pressure. Test pressure not-to-exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed either 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."
  - e. After hydrostatic test pressure has been applied for at least four hours, examine piping, joints and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
  - f. Prepare written report of testing.

D. Flushing and Cleaning of Piping Systems:

1. Clean piping systems thoroughly. Purge pipe of construction debris and contamination before placing the piping systems in service. Provide temporary connections for cleaning, purging, and circulating fluids through the piping system.
2. Use temporary strainers and temporary pumps that can create fluid velocities up to 10 feet per second to flush and clean the piping systems. Do not use Owner's permanent strainers to trap debris during pipe flushing operations. Fit the temporary construction strainers with a line size blowoff valve.
3. When constructing minor piping modifications or additions, verify with Owner if the Owner's pumps and strainers can be used for flushing and chemical cleaning operations. When the flushing and cleaning operations are complete, ensure the strainer baskets and screens installed in the piping systems permanent strainers are replaced with clean elements. Keep temporary strainers in service until the

equipment has been tested, then replace straining element with a new strainer and clean and deliver the old straining elements to Owner. Fit the Owner's strainers with a line size blowoff valve.

4. Install bypass piping or hoses at the supply and return piping connections at heat exchangers, chillers, cooling towers, pumps, and cooling coils, etc., to prevent debris from being caught or causing damage to equipment which will be connected to the piping system.
5. Circulate a chemical cleaner in chilled and heating water piping systems to remove mill scale, grease, oil, and silt. Cleaner to be selected by chemical treatment vendor on project. Circulate for 48 hours, flush system and replace with clean water. Dispose of chemical solution in accordance with local codes. The chilled and heating water system should then be treated with chemicals and inhibitors to be selected by chemical treatment vendor on project. When the chemical cleaning is complete, remove, clean, and reinstall all permanent screens. Notify Owner so that the reinstallation of clean strainer screens may be witnessed.

### 3.2 REFRIGERANT PIPING INSTALLATION

- A. Install systems in accordance with ASHRAE Standard 15.
- B. Group piping whenever practical at common elevations and locations. Slope piping one percent in direction of oil return.
- C. Arrange piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- D. Flood piping system with nitrogen when brazing.
- E. Follow ASHRAE Standard 15 procedures for charging and purging of systems and for disposal of refrigerant.
- F. Provide replaceable cartridge filter-driers, with isolation valves and valved bypass.
- G. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.
- H. Fully charge completed system with refrigerant after testing.
- I. Field Quality Control:
  1. Test refrigeration system in accordance with ASME B31.5.
  2. Pressure test system with dry nitrogen to 200 PSI. Perform final tests at 27-inches vacuum and 200 PSI using electronic leak detector. Test to no leakage.

**END OF SECTION**

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**SECTION 23 36 00**

**AIR TERMINAL UNITS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Single Duct Variable Volume and Constant Volume Units
2. Dual Duct Variable Volume Units

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Titus
- B. Price
- C. Krueger
- D. Trane
- E. Nailor

- F. Greenheck
- G. Or approved equivalent.

## 2.2 SINGLE DUCT VARIABLE VOLUME AND CONSTANT VOLUME UNITS

- A. Casings: Minimum 22 gauge galvanized steel.
- B. 1/2-inch dual density insulation which complies with UL 181 and NFPA 90A. Exposed insulation edges to be coated with NFPA 90A approved sealant to prevent entrainment of fibers in the airstream.
- C. Engineered polymer foam insulation which complies to UL181 and NFPA 90A. Insulation to be 1-1/2 pound density, closed cell foam. Exposed fiberglass is not acceptable. The insulation to be mechanically fastened to the unit casing.
- D. Non-porous, sealed liner which complies with UL 181 and NFPA 90A. Insulation to be 4-pound density. Cut edges must be sealed from the airstream using mechanically bonded metal barrier strips. Liners made of Mylar, Tedlar, Silane or woven fiberglass cloth are not acceptable
- E. 1-inch thick matte faced insulation, meeting UL 181 and NFPA 90A, enclosed between the unit casing and a non-perforated internal 22 gauge sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.
- F. Plenum Air Inlets: Round stub connections or S slip drive connections for duct attachment.
- G. Plenum Air Outlets: S slip and drive connections.
- H. Casing Leakage: Maximum casing leakage not to exceed 10 cfm at 1-inch static pressure for inlet size larger than 12-inches and not to exceed 7 cfm at 1-inch static pressure for inlet size 12-inches and smaller.
  - 1. Configuration: Air volume damper assembly inside unit casing. Locate control components inside protective metal shroud.
  - 2. Volume Damper: Construct of galvanized steel with peripheral gasket and self lubricating bearings; maximum damper leakage: 7 cfm maximum at inlet static pressure. Shaft to be clearly marked on the end to indicate damper position. Stickers or other removable markings are not acceptable. Damper to incorporate a mechanical stop to prevent overstroking and a synthetic seal to limit close off leakage to the maximum values shown in the damper leakage table.
  - 3. Flow Sensor: Integral averaging type flow sensor utilizing multiple sensing points with unit mounted calibration chart.
  - 4. Mount damper operator to position damper normally open.
- I. Attenuator Section: Line attenuator sections with 2-inch thick insulation.
- J. Attenuator Section: Line attenuator sections with 1-inch thick insulation.

K. Hot Water Heating Coil:

1. Construction: 1/2-inch copper tube mechanically expanded into aluminum plate fins, leak tested under water to 200 PSIG pressure, factory installed.

L. Electric Heating Coils:

1. Construction: UL listed, slip-in type, open coil design, integral control box factory wired and installed with:
  - a. Primary and secondary over-temperature protection.
  - b. Minimum airflow switch.
  - c. Integral door interlock disconnect switch
  - d. Pneumatic/electric switches and relays or Magnetic contactor for each step of control.
2. Electrical Characteristics: Reference Drawings.

M. Acoustics: Sound ratings tested as power level 10-12 watts in accordance with AHRI 880 standard at 1.5-inches WG inlet static pressure. NC ratings calculated per AHRI 885-2008 with room attenuations as listed in Appendix E, and not to exceed values scheduled on drawings.

1. MAXIMUM AIRBORNE SOUND POWER (db)
  - a. OCTAVE BAND AND CENTER FREQUENCY (HZ)
  - b. Units must have 5-feet 0-inches of 2-inch thick lined duct downstream of terminal unit.

CFM	2	3	4	5	6	7
	125	250	500	1K	2K	4K
0-300	69	65	63	60	60	55
301-400	70	69	64	60	60	55
401-800	72	70	67	64	60	55
801-1100	74	71	68	67	60	60
1101-1700	75	73	70	67	60	60
1701 and above	80	78	76	67	63	62

- N. DDC Controls: Damper operator, sensor, and other devices compatible with temperature controls specified in 23 09 00, Instrumentation and Control Performance Specifications.
- O. Electric Controls: 24-V damper actuator with wall-mounted electric thermostat and appropriate mounting hardware.



- P. Pneumatic Controls: Damper operator, velocity controller, and thermostat.
  - 1. Damper Operator: 8-PSIG to 13-PSIG spring range.
  - 2. Velocity Controller: Factory calibrated to minimum and maximum air volumes, field adjustable; maintains constant airflow dictated by thermostat within 5 percent of set point while compensating for inlet static-pressure variations up to 4-inches wg.
  - 3. Thermostat: Wall-mounted pneumatic type with appropriate mounting hardware.
- Q. Electronic Controls: Bidirectional damper operator and microprocessor-based controller with integral airflow transducer and room sensor provide control with the following features:
  - 1. Proportional plus integral control of room temperature.
  - 2. Time-proportional reheat-coil control.
  - 3. Occupied/unoccupied operating mode.
  - 4. Remote reset of airflow or temperature set points.
  - 5. Adjusting and monitoring with portable terminal.
  - 6. Communication with temperature-control system specified in other Division 23, HVAC sections.

## 2.3 DUAL DUCT VARIABLE VOLUME UNITS

- A. Basic Assembly:
  - 1. Casings: Minimum 22 gauge galvanized steel.
  - 2. 1/2-inch dual density insulation which complies with UL 181 and NFPA 90A. Exposed insulation edges to be coated with NFPA 90A approved sealant to prevent entrainment of fibers in the airstream.
  - 3. Engineered polymer foam insulation which complies to UL181 and NFPA 90A. Insulation to be 1-1/2 pound density, closed cell foam. Exposed fiberglass is not acceptable. The insulation to be mechanically fastened to the unit casing.
  - 4. Non-porous, sealed liner which complies with UL 181 and NFPA 90A. Insulation to be 4-pound density. Cut edges must be sealed from the airstream using mechanically bonded metal barrier strips. Liners made of Mylar, Tedlar, Silane or woven fiberglass cloth are not acceptable
  - 5. 1-inch thick matte faced insulation, meeting UL 181 and NFPA 90A, enclosed between the unit casing and a non-perforated internal 22 gauge sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.

6. Plenum Air Inlets: Round stub connections or S slip drive connections for duct attachment.
7. Plenum Air Outlets: S slip and drive connections.
8. Casing Leakage: Maximum casing leakage not to exceed 10 cfm at 1.0-inches static pressure for inlet size larger than 12-inch and not to exceed 7 cfm at 1.0-inches static pressure for inlet size 12-inch and smaller.

B. Basic Unit:

1. Configuration: Two air volume dampers inside unit casing with mixing attenuator section. Locate control components inside protective metal shrouds.
2. Volume Dampers: Construct of galvanized steel with peripheral gasket and self lubricating bearings; maximum damper leakage: 7 cfm maximum at 3-inches inlet static pressure. Shaft to be clearly marked on the end to indicate damper position. Stickers or other removable markings are not acceptable. the damper to incorporate a mechanical stop to prevent overstroking and a synthetic seal to limit close off leakage to the maximum values shown in the damper leakage table.
3. Mount damper operators to position dampers normally open.
4. Flow Sensors: Integral averaging type flow sensor utilizing multiple sensing points with unit mounted calibration chart in each inlet duct .

C. Attenuator Section: Line attenuator sections with 2-inch thick insulation.

D. Attenuator Section: Line attenuator sections with 1-inch thick insulation.

E. Multi Outlet Attenuator Section: With 6-inch diameter collars, each with butterfly balancing damper with lock.

F. Multi Outlet Attenuator Section: With round diameter collars, size as indicated, each with butterfly balancing damper with lock.

G. Acoustics: Sound ratings tested as power level 10-12 watts in accordance with ARI 880 standard at 1.5-inches WG inlet static pressure, not to exceed:

H. MAXIMUM AIRBORNE SOUND POWER (db)

1. OCTAVE BAND AND CENTER FREQUENCY (HZ)

CFM	2	3	4	5	6	7
	125	250	500	1K	2K	4K
0-300	69	65	63	60	60	55
301-400	70	69	64	60	60	55
401-800	72	70	67	64	60	55
801-1100	74	71	68	67	60	60
1101-1700	75	73	70	67	60	60

1701 & above	80	78	76	67	63	62
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I. MAXIMUM RADIATED SOUND POWER (db)

1. OCTAVE BAND AND CENTER FREQUENCY (HZ)

CFM	2	3	4	5	6	7
	125	250	500	1K	2K	4K
All	71	65	61	55	55	50

J. DDC Controls: Damper operator, thermostat, and other devices compatible with temperature controls specified in Section 23 09 00, Instrumentation and Control Performance Specifications.

K. Electric Controls: 24-V damper actuator with wall-mounted electric thermostat and appropriate mounting hardware.

L. Pneumatic Controls: Damper operator, velocity controller, and thermostat.

1. Damper Operator: 8-PSIG to 13-PSIG spring range.
2. Velocity Controller: Factory calibrated to minimum and maximum air volumes, field adjustable; maintains constant airflow dictated by thermostat within 5 percent of set point while compensating for inlet static-pressure variations up to 4-inches wg.
3. Thermostat: Wall-mounted pneumatic type with appropriate mounting hardware.

M. Electronic Controls: Bidirectional damper operator and microprocessor-based controller with integral airflow transducer and room sensor provide control with the following features:

1. Proportional plus integral control of room temperature.
2. Time-proportional reheat-coil control.
3. Occupied/unoccupied operating mode.
4. Remote reset of airflow or temperature set points.
5. Adjusting and monitoring with portable terminal.
6. Communication with temperature-control system specified in other Division 23, HVAC sections.

## **PART 3 - EXECUTION**

### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Upon completion of installation and prior to initial operation, test and demonstrate that air terminals and duct connection to air terminals are leak tight. Repair or replace air terminals and duct connections as required to eliminate leaks and retest to demonstrate compliance.
- B. Verify that installation of each air terminal is according to the Contract Documents.
- C. Check that inlet duct connections are as recommended by air terminal manufacturer to achieve proper performance.
- D. Check that controls and control enclosure are accessible.
- E. Verify that control connections are complete.
- F. Check that nameplate and identification tag are visible.
- G. Verify that controls respond to inputs as specified.

### **3.2 SINGLE DUCT VARIABLE AND CONSTANT VOLUME UNITS**

- A. Install in accordance with manufacturer's instructions. Install level and plumb.
- B. Provide ceiling access doors or locate units above easily removable ceiling components.
- C. Support units individually from structure. Do not support from adjacent ductwork.
- D. Provide 9-inch by 9-inch access door with quarter turn latches upstream and downstream of each heating coil.
- E. Provide minimum five duct diameters minimum straight duct run upstream of terminal unit.
- F. Minimum of 3-feet straight duct downstream of terminal unit prior to first outlet or first branch duct.
- G. Branch inlet duct size to match unit inlet connection. For branch inlet ducts over 15-feet long, increase branch duct size one size and provide transition immediately upstream of minimum straight duct run.
- H. Provide minimum of 5-ft of 1-inch thick lined ductwork downstream of units. Lining to match terminal unit lining type.
  - 1. Do not provide lined ductwork in group "H" occupancies.
- I. Verify that electric power is available and of the correct characteristics.
- J. Balance unit to air flows scheduled.

### 3.3 DUAL DUCT VARIABLE VOLUME UNITS

- A. Install in accordance with manufacturer's instructions. Install level and plumb.
- B. Provide ceiling access doors or locate units above easily removable ceiling components.
- C. Support units individually from structure. Do not support from adjacent ductwork.
- D. Provide 9-inch by 9-inch access door with quarter turn latches upstream and downstream of each heating coil.
- E. Provide minimum five duct diameters minimum straight duct run upstream of terminal unit.
- F. Minimum of 3-feet straight duct downstream of terminal unit prior to first outlet or first branch duct.
- G. Branch inlet duct size to match unit inlet connection. For branch inlet ducts over 15-feet long, increase branch duct size one size and provide transition immediately upstream of minimum straight duct run.
- H. Provide minimum of 5-ft of 1-inch thick lined ductwork downstream of units. Lining to match terminal unit lining type.
  - 1. Do not provide lined ductwork in group "H" occupancies.
- I. Verify that electric power is available and of the correct characteristics.
- J. Balance unit to air flows scheduled.

**END OF SECTION**

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**SECTION 23 37 00**

**AIR OUTLETS AND INLETS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Grilles, Registers, Diffusers

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, provide:

1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
2. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
3. Schedule of diffusers, registers, and grilles indicating drawing designation, room location, quantity, model number, size and accessories furnished.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:

1. Air Distribution Diffuser, Register, and Grille Schedule lists Basis of Design, with any specialty accessories, construction, finish or other criteria noted on schedule. Submitted air distribution must match criteria of Basis of Design:
  - a. Construction materials and appearance.
  - b. Frame/installation method.

- c. Isothermal throw plus or minus 5 percent at design flows shown on drawings.
- d. Noise Criteria: NC value plus or minus 1 at design flows shown on drawings.
- e. Accessories: Equal to Basis of Design.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 23, HVAC sections, where more than a single type is specified for the application, provide single selection for each product category.
- B. Grilles, Registers, Diffusers:
  - 1. Anemostat
  - 2. Carnes
  - 3. Environmental Air Products
  - 4. Kruger
  - 5. Metalaire
  - 6. Nailor
  - 7. Price Co.
  - 8. Shoemaker
  - 9. Titus
  - 10. Tuttle & Bailey
  - 11. Seiho
  - 12. Or approved equivalent.

### 2.2 GRILLES, REGISTERS, DIFFUSERS

- A. Diffuser, Register and Grille Schedule lists Basis of Design, with specialty accessories, construction, finish or other criteria noted on schedule. Submitted air distribution must match criteria of Basis of Design, including accessories and finish:

1. Matching construction materials and appearance. Equal installation method/frame.
  2. Pressure drop equal to or less than Basis of Design at CFM on Drawings.
  3. Throw: Isothermal jet throw plus or minus 5 percent of Basis of Design at CFM listed on Drawings.
  4. Noise Criteria: Plus or minus 1 NC of Basis of Design at CFM listed on Drawings. If Basis of Design NC is below registered level, submitted must match. NC rating with 10 dB room factor or less.
- B. Provide 1-, 2-, 3-, or 4-way deflection as indicated on Drawings.
- C. Provide pattern controllers for linear supply air diffusers.
- D. Register Dampers: Dampers utilized with grilles. Opposed blade dampers utilizing a side operated worm drive which provides external duct operation. Slot the end of the shaft to receive a screwdriver. Factory assembled side operator. Construct of the same material as the grille. Manufacturer same as grilles/diffuser.
- E. Coordinate mounting frames with ceiling construction type. Verify per reflected ceiling plans.

## **PART 3 - EXECUTION**

### **3.1 GENERAL INSTALLATION**

- A. Install in accordance with manufacturer's instructions. Provide seismic supports, clips, and bracing per local code. Coordinate installation of framing. Provide complete coverage of rough openings by integral device flanges or auxiliary frames. Where above ceiling location is unconditioned space, caulk rough openings; repair and re-paint locations where dust entrainment streaks develop due to unsealed openings.
- B. Damp locations, such as lockers, restrooms, showers, natatoriums, whirlpool/spas, to have aluminum construction even if scheduled otherwise; mounting hardware to be stainless steel.
- C. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- D. Unless otherwise shown on drawings, for ceiling mounted air outlets with adjustable airflow pattern controllers mounted at a height of 12 feet or less, adjust the air outlets for horizontal air distribution, and adjust to vertical air distribution for ceiling height above 12 feet.
- E. Exterior color of grilles per Architect. White finish if not otherwise scheduled or noted by Architect. Paint ductwork visible behind air outlets and inlets matte black.
- F. Ceiling Membrane: Protect ceiling membrane per code. Fire caulk around openings. Provide listed radiation damper in rated roof/ceiling or floor/ceiling assemblies as required per code.



- G. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

### 3.2 GRILLES, REGISTERS AND DIFFUSERS INSTALLATION

- A. Coordinate with Architectural Reflected Ceiling Plan(s). Reflected ceiling plans determine final locations.
- B. Install diffusers to ductwork with air tight connection. 18-inch straight duct section or acoustic plenum at connection. Provide square to round adapters where required for connection to round ducts.
- C. Provide integral balancing dampers for diffusers, and grilles and registers where duct manual balancing dampers are not shown or specified.
- D. Linear Slot Diffusers:
  - 1. Coordinate connection plenum dimensions with linear slot final dimensions to conform with manufacturer's recommendations, or as indicated. Total and active lengths as noted on drawings. Blank off unused sections. Coordinate frame type with Architect.
  - 2. Paint surfaces visible behind air outlets and inlets, including blank-off sections, matte black unless otherwise called for on drawings.

### END OF SECTION

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**SECTION 23 62 01**

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**VARIABLE REFRIGERANT FLOW\_VOLUME (VRF\_VRV) SYSTEMS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Outdoor Unit (Non-Heat Recovery)
  - 2. Indoor Unit - Wall Mounted
  - 3. Controls for VRV Systems
- B. Variable capacity, heat pump air conditioning system.
- C. System consists of an outdoor unit, branch circuit terminal or branch selector units, multiple indoor fan units and PID DDC (Direct Digital Controls). Each indoor unit or group of indoor units capable of operating in any mode independently of other indoor units or groups. System capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation. Each indoor unit or group of indoor units independently controlled. Sum of connected capacity of indoor air handlers range from 50 percent to 130 percent of outdoor rated capacity.
- D. Variable capacity heat pump system (non-heat recovery) system consist of outdoor unit, multiple indoor units and PID DDC (Direct Digital Controls). Sum of connected capacity of indoor air handlers range from 50 percent to 130 percent of outdoor rated capacity. Heating mode or cooling mode/no simultaneous operation.

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:

1. Facility manufacturing registered to ISO 9001 and ISO 14001.
2. Full charge of R-410A provided in condensing unit from factory.
3. Units to be listed by Electrical Laboratories (ETL) and bear the ETL label.
4. Wiring in accordance with the National Electric Code (NEC).
5. The system will bear the Energy Star label.
6. The installing contractor to receive instruction and training from the equipment manufacturer prior to installation. Instruction to cover manufacturer's recommended methods for piping, wiring, leak testing, etc. Documentation of the training is to be provided to the Architect for review.

1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
1. Five year warranty on compressor(s).

**PART 2 - PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

- A. Daikin (latest series).
- B. Mitsubishi (latest series).
- C. LG.
- D. Approved Alternate Manufacturer: Drawings indicate Basis of Design manufacturer, alternate acceptable manufacturers listed may be provided, meeting capacities of Basis of Design system. Each alternate manufacturer has a specific refrigerant distribution system that is proprietary. Therefore, alternate proposed systems are to include the cost of refrigerant distribution modifications, equipment location modification, condensate and secondary condensate over flow modifications, electrical modifications, architectural modifications, structural modifications, maintenance and access modifications, and other modifications required to submit the manufacturer that is not the Basis of Design.

2.2 OUTDOOR UNIT (NON-HEAT RECOVERY)

- A. General:

1. Outdoor unit with manufacturer components. Multiple circuit boards that interface to controls system to perform functions necessary for operation. Factory assembled, piped, wired and run tested.
2. Outdoor unit will have a sound rating no higher than 60 dB(A) individually or 65 dB(A) twinned. Units to have a sound rating no higher than 50 dB(A) individually or 55 dB(A) twinned while in night mode operation.
3. Refrigerant lines from outdoor unit to indoor units insulated.
4. Outdoor unit have an accumulator with refrigerant level sensors and controls.
5. Outdoor unit have a high pressure safety switch, over-current protection and DC bus protection.
6. Heating mode operation down to minus 0 degrees F ambient temperature or cooling mode down to 23 degrees F ambient temperature, without additional low ambient controls.
7. High efficiency oil separator plus additional logic controls to maintain adequate oil volume in compressor.
8. The system will automatically restart operation after a power failure and will not cause any settings to be lost. System not to require re-programming in the event of power failure.
9. The outdoor unit to be modular in design and to allow for side-by-side installation following manufacturer's recommended clearances.

B. Unit Cabinet:

1. Casings to be completely weatherproof and fabricated of galvanized steel, bonderized and finished. withstand 960 hours per ASTM B117 criteria for seacoast protected models.

C. Fan:

1. Direct drive, variable speed propeller type fan.
2. Fan motor inherent protection, permanently lubricated bearings, and completely variable speed operation via a DC inverter.
3. Fan factory set for operation under 0-inch WG external static pressure, but capable of normal operation under a maximum of 0.24-inch WG external static pressure via dipswitch.
4. Fan motor mounted for quiet operation.
5. Raised guard to prevent contact with moving parts.
6. Outdoor unit to have vertical or horizontal discharge airflow.

D. Refrigerant:

1. R410A refrigerant.

E. Outdoor Coil:

1. Nonferrous construction with lanced or corrugated plate fins on copper tubing.
2. Factory applied corrosion resistant finish.
3. Integral metal coil guard.
4. Inverter driven compressor refrigerant flow control.

F. Compressor:

1. Inverter driven scroll hermetic compressor.
2. Crankcase heater.
3. Outdoor unit compressor have inverter to modulate capacity. Variable capacity turndown of 18-4 percent of rated capacity, depending upon unit size.
4. Internal thermal overload.
5. The compressor(s) to be mounted on rubber-in-shear isolators to avoid the transmission of vibration.

G. Electrical:

1. The power supply to the outdoor unit to be as scheduled on the drawings.
2. The control voltage between the indoor and outdoor unit to be 16 VDC or 24 VDC non-shielded 2 conductor cable.
3. The control wiring to be a two-wire multiplex transmission system, connecting multiple indoor units to one outdoor unit with a single 2-cable wire.

## 2.3 INDOOR UNIT - WALL MOUNTED

A. General:

1. Wall-mounted indoor unit Section with modulating linear expansion device matched to outdoor unit.
2. Factory assembled, wired and run tested. Factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. Self-diagnostic function, 3-minute time delay mechanism, auto restart function, and test run switch.

3. Indoor unit and refrigerant pipes pre-charged with dehydrated air before shipment from factory.
- B. Unit Cabinet:
1. Manufacturers standard finish.
  2. Multi directional drain and refrigerant piping.
  3. Separate back plate to secure unit firmly to wall.
- C. Fan:
1. One or two line-flow fan(s) direct driven by single motor.
  2. Statically and dynamically balanced; permanently lubricated bearing motor.
  3. Manual adjustable guide vane with ability to change airflow from side to side (left to right).
  4. Motorized air sweep louver for automatic change in airflow by directing air up and down to provide uniform air distribution.
- D. Filter:
1. Easily removable, washable or disposable return filter.
- E. Evaporator Coil:
1. Nonferrous construction with smooth plate fins on copper tubing with inner grooves for high efficiency heat exchange.
  2. Brazed tube joints with phos-copper or silver alloy.
  3. Pressure tested at factory.
  4. Condensate pan and drain under coil.
  5. Insulated refrigerant lines.
- F. Controls:
1. The unit to have PID controls provided by manufacturer to perform input functions necessary to operate the system. No third party building management system to be required, however, VRV/VRF system to be capable of communicating with third party BMS.
  2. The unit to be compatible with interfacing with connection to BACnet networks.

## 2.4 CONTROLS FOR VRV SYSTEMS

### A. General:

1. Provide devices required for integrated web based interface, graphical user workstation, and system integration to Building Management Systems via BACNet protocol.
2. Wiring type: Wiring 2-conductor (16 AWG), twisted shielded pair, and stranded wire.

### B. Controls Network:

1. Controls Network consists of remote controllers, schedule timers, system controllers, centralized controllers, and integrated web based interface communicating over high-speed communication bus. Controls network support operation monitoring, scheduling, error email distribution, personal browsers, tenant billing, online maintenance support, and integration with Building Management Systems. Provide interfaces to support communication protocols.
2. Simple Remote Controller: Simple Remote Controller capable of controlling up to a minimum of 12 indoor units (defined as 1 group). Controller supports temperature display selection of Fahrenheit or Celsius. Controller will allow user to change on/off, mode (cool, heat, auto, dry, and fan), temperature setting, and fan speed setting. Controller able to limit set temperature range from Simple remote controller. Room temperature sensed at either Controller or Indoor Unit dependent on indoor unit dipswitch setting. Controller will display a four-digit error code in event of system abnormality/error.

### C. System Integration

1. Control system capable of supporting integration with Building Management Systems (BMS) using BACNet protocol.
2. Operation and monitoring points include, but are not limited to:
  - a. ON/OFF (setting).
  - b. ON/OFF (status).
  - c. Alarm Sign.
  - d. Error Code.
  - e. Operation Mode (setting).
  - f. Operation Mode (status).
  - g. Fan Speed (setting).
  - h. Fan Speed (status).

- i. Measured Room Temperature.
- j. Set Room Temperature.
- k. Filter Limit Sign.
- l. Filter Limit Sign Reset.
- m. Remote Control Operation (ON/OFF).
- n. Remote Control Operation (Operation Mode).
- o. Remote Control Operation (Set Temperature).
- p. Electrical Total Power.
- q. Communication Status.
- r. System Forced OFF.
- s. Forced Thermostat OFF (setting).
- t. Forced Thermostat OFF (status).
- u. Compressor Status.
- v. Indoor Fan Status.
- w. Heater Operation Status.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

##### **A. General:**

- 1. Install all refrigerant piping and condensate tubing concealed inside wall at all wall mounted units.

##### **B. Insulation:**

- 1. Insulate refrigerant piping, condensate drains, drip pans, and other associated appurtenances.

##### **C. Controls:**

- 1. Wiring: Control wiring install in a system daisy chain configuration per manufacturer's installation instructions.



2. Control wiring for schedule timers, system controllers, and centralized controllers installed in a daisy chain configuration per manufacturer's installation instructions.
3. Control wiring for remote controllers from remote controller to first associated indoor unit then to remaining associate indoor units in a daisy chain configuration per manufacturer's installation instructions.

D. Indoor Units:

1. Connect refrigerant piping to unit, run piping so as not to interfere with access to unit. Install furnished field mounted accessories. Install per manufacturer's requirements and provide accumulator when required due to length of refrigerant piping. Install rigid, level and plumb.
2. Where manufacturer's standard condensate pump does not provide adequate lift, provide condensate pump that will meet lift requirements. Confirm unit shutdown upon failure of condensate pump.
3. Provide vibration isolation as indicated on drawings.
4. Provide condensate drainage from indoor units and branch selection devices. Provide secondary overflow pans and piping to observable location as required for concealed units.

E. Cleaning:

1. Prior to acceptance, thoroughly clean equipment, remove shipping labels and traces of foreign substance. Touch up with factory matching paint on scratched surfaces.

F. Start-Up:

1. Factory certified service representative to supervise start-up in accordance with manufacturer's instructions.
2. Make final adjustments to assure proper operation of load system. Demonstrate final set up and programming to Owner.
3. Test units in modes of operation and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

### 3.2 INDOOR UNIT - WALL MOUNTED

A. Indoor Units:

1. Connect refrigerant piping to unit, run piping so as not to interfere with access to unit. Install furnished field mounted accessories. Install per manufacturer's requirements and provide accumulator when required due to length of refrigerant piping. Install rigid, level and plumb.

2. Where manufacturer's standard condensate pump does not provide adequate lift, provide condensate pump that will meet lift requirements. Confirm unit shutdown upon failure of condensate pump.
3. Provide vibration isolation as indicated on drawings.
4. Provide condensate drainage from indoor units and branch selection devices. Provide secondary overflow pans and piping to observable location as required for concealed units.

B. Install per manufacturer's written instructions and requirements.

### 3.3 CONTROLS FOR VRV SYSTEMS

A. Install per manufacturer's written instructions and requirements.

**END OF SECTION**

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**SECTION 23 63 13**

**AIR COOLED REFRIGERANT CONDENSERS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Manufactured Units
2. Casing
3. Condenser Coils
4. Fans and Motors
5. Controls

**1.2 RELATED SECTIONS**

- A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
1. Product Data: Provide rated capacities, weights, accessories, electrical requirements, and wiring diagrams.
  2. Shop Drawings: Indicate components, assembly, dimensions, weights and loading, required clearances, and location and size of field connections. Include schematic layouts showing condenser, refrigeration compressors, cooling coils, refrigerant piping and accessories required for complete system.
  3. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.
  4. Operation and Maintenance Data: Include start-up instructions, maintenance instructions, parts lists, controls, and accessories.

## 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this Section, with minimum three years of documented experience.
  - 2. Installer Qualifications: Company specializing in performing the work of this Section with minimum \_\_\_\_\_ years of experience.
  - 3. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The Carrier Corporation
- B. The Trane Company
- C. York International Corporation
- D. Daikin Applied
- E. AAON
- F. Or approved equivalent.

### 2.2 MANUFACTURED UNITS

- A. Provide packaged, factory assembled, pre-wired unit, suitable for outdoor use consisting of casing, condensing coil and fans, integral sub-cooling coil liquid accumulator, screens, and controls.
- B. Construction and Ratings: In accordance with ARI 210/240 and UL 207. Provide testing in accordance with ASHRAE Std 20.
- C. Performance Ratings: Energy Efficient Rating (EER)/Coefficient of Performance (COP) not less than prescribed by ASHRAE Std 90.1 , in combination with compressor units.

### 2.3 CASING

- A. House components in welded steel frame with steel panels with weather resistant, baked enamel finish.
- B. Mount starters, disconnects, and controls in weatherproof panel provided with full opening access doors. Provide mechanical interlock to disconnect power when door is opened.
- C. Provide removable access doors or panels with quick fasteners.
- D. Provide welded steel floor mounting stand and duct collars at coil inlet and fan outlet.

### 2.4 CONDENSER COILS

- A. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Provide sub-cooling circuits. Air test under water to 425 PSIG, and vacuum dehydrate. Seal with holding charge of nitrogen.
- B. Coil Guard: Expanded metal with lint screens.
- C. Configuration: Single refrigeration circuit with receiver.

### 2.5 FANS AND MOTORS

- A. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor or 3 phase, with permanent lubricated ball bearings and built-in current and thermal overload protection.
- B. Vertical discharge direct driven propeller type condenser fans with fan guard on discharge , equipped with roller or ball bearings with grease fittings extended to outside of casing.
- C. Horizontal discharge, double width, double inlet forward curved centrifugal type condenser fans, equipped with roller or ball bearings with grease fittings extended to outside of casing, V-belt drive with belt guard.

### 2.6 CONTROLS

- A. Provide factory wired and mounted control panel, NEMA 250, containing fan motor starters, fan cycling thermostats, compressor interlock, and control transformer.
- B. Provide controls to permit operation down to \_\_\_\_ degrees F ambient temperature.
- C. Provide thermostat to cycle fan motors in response to outdoor ambient temperature.
- D. Provide head pressure switch to cycle fan motors in response to refrigerant condensing pressure.
- E. Provide solid state control to vary speed of one condenser fan motor in response to refrigerant condensing pressure.

- F. Provide electronic low ambient control consisting of mixing damper assembly, controlled to maintain constant refrigerant condensing pressure.
- G. Provide with interface to communicate with BMS.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. Provide for connection to electrical service. Reference Division 26, Electrical.
- C. Align condensers on concrete foundations. Reference Division 03, Concrete.
- D. Install units on vibration isolation. Reference Section 23 05 48, Vibration and Seismic Controls for HVAC Equipment.
- E. Provide connection to refrigeration piping system. Reference Division 23, HVAC. Comply with ASHRAE Std 15.
- F. Provide cooling season start-up, winter season shut-down service, for first year of operation.
- G. Shut-down system if initial start-up and testing takes place in winter and machines are to remain inoperative. Repeat start-up and testing operation at beginning of first cooling season.

#### **3.2 MANUFACTURED UNITS**

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. See General Installation Requirements above for additional information.

#### **3.3 CASING**

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. See General Installation Requirements above for additional information.

#### **3.4 CONDENSER COILS**

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. See General Installation Requirements above for additional information.

#### **3.5 FANS AND MOTORS**

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. See General Installation Requirements above for additional information.

3.6 CONTROLS

- A. Install in accordance with manufacturer's written instructions and guidelines.
- B. See General Installation Requirements above for additional information.

**END OF SECTION**

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**SECTION 23 81 26**

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**SMALL SPLIT SYSTEM AND UNITARY HVAC EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included: Materials, installation and testing of:

1. Ductless Split Systems - Cooling Only
2. Split System Indoor Fan Coil Unit

**1.2 RELATED SECTIONS**

A. Contents of Section 23 00 00, HVAC Basic Requirements and Division 1, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 1, General Requirements.

B. In addition, meet the following:

1. ARI 210

**1.4 SUBMITTALS**

A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 1, General Requirements.

**1.5 QUALITY ASSURANCE**

A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 1, General Requirements.

B. In addition, meet the following:

1. Efficiency ratings, cooling/heating performance, fan performance, sound performance to meet or exceed Basis of Design as scheduled on Drawings.

**1.6 WARRANTY**

A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 1, General Requirements.

B. In addition, provide:

1. Refrigeration compressor(s): 5-year warranty.



2. Furnace heat exchanger: 5-year warranty.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

#### **A. Ductless Split Systems:**

1. Mitsubishi
2. Sanyo
3. Daikin Applied
4. LG
5. Carrier
6. Friederich
7. Or approved equivalent.

#### **B. Split System Indoor Fan Coil Unit:**

1. Carrier
2. Trane
3. York
4. Greenheck
5. International Environmental
6. Or approved equivalent.

### **2.2 DUCTLESS SPLIT SYSTEMS - COOLING ONLY**

#### **A. Description: Self-contained, matched factory-engineered and assembled. Pre-wired indoor and outdoor units. UL/ETL listed.**

#### **B. Outdoor Unit:**

1. Self contained, consisting of cabinet, compressor system, condenser fan matched to indoor unit.
2. Cabinet: Fabricated of galvanized steel, bonderized, and finished with powder coated baked enamel.
3. Refrigerant System:
  - a. HFC refrigerant or other refrigerant with zero ozone depletion potential (ODP)

- b. Compressor: To be inverter driven, hermetic rotary type.
- 4. Air System:
  - a. Fan: Propeller Type with one direct drive, inverter driven, variable speed motor.
  - b. Motor: Premium efficiency with inherent protection, permanently lubricated bearings and variable speed drive compatible.
  - c. Coil: Copper tubes and aluminum fins coated for corrosion protection.
- 5. Controls: Single source for both indoor and outdoor units, with low/high pressure switch capable of communicating to/from the building DDC control system.
- C. Indoor Unit(s):
  - 1. Self contained wall mounted evaporator unit(s) matched to outdoor unit.
  - 2. Cabinet:
    - a. Non-flammable, high impact polymer with a white finish.
    - b. Power Source: To be a single point power connection or sub-fed from outdoor condensing unit.
  - 3. Refrigeration System: HFC refrigerant or other refrigerant with zero ozone depletion potential (ODP).
  - 4. Air System:
    - a. Fan: An assembly with one or two inline fan(s) with a single direct drive motor.
    - b. Filter: Polypropylene, furnished with the unit, removable and washable.
    - c. Coil: Direct expansion type with copper tubes mechanically bonded into aluminum fins.
  - 5. Condensate Drain:
    - a. Provide drain pan sloped to drain away from unit. Drain pan with a single drain connection.
    - b. Condensate pump kit provided with unit.
    - c. Secondary drain pan; Condensate overflow shut-off float switch and external alarm.
  - 6. Controls: Wired thermostat. Control to be integral with unit.

## 2.3 SPLIT-SYSTEM INDOOR FAN COIL UNIT

- A. Indoor fan unit matched to outdoor condensing unit. Self-contained, packaged, factory-assembled, pre-wired unit with direct expansion evaporator coil, cabinet supply fan, filter housing and controls. Accessories, economizer assembly, etc. as scheduled and shown on Drawings.
- B. Components:
  - 1. Steel cabinet with baked enamel finish or galvanized steel; minimum 1/2-inch thick, 1-1/2# liner with cleanable facing or solid interior metal panel, filter housing suitable for 1-inch thick filter or filter housing suitable for 2-inch thick filter. Easily removed access panels.
  - 2. Economizer/Mixing Box with damper actuator.
- C. Refrigeration System: HFC Refrigerant or other refrigerant with zero ozone depletion potential (ODP).
- D. Air System:
  - 1. Supply Fan (Evaporator Fan): centrifugal multi-speed direct drive, ECM motor drive, or V-belt with internal vibration isolation.
  - 2. Evaporator Motor: Premium efficiency with permanently lubricated bearings thermal overload protection. Provide optional high static motor.
  - 3. Evaporator Coil: Seamless copper tubes expanded into aluminum fins. Galvanized or polymer drain pan sloped in all directions.
  - 4. Filter: MERV 8, 1-inch thick or 2-inch thick, pleated, throw-away.
  - 5. Supplemental Heat Coil:
    - a. Electric Heat Coil: UL Listed with helix wound bare nichrome wire heating elements. Heat output and staging as scheduled. Power usage per stage is not to exceed 5 kilowatts. Staging of coil heat internally controlled.
    - b. Hot water coil: copper tubes mechanically bonded into aluminum fins, arranged for counter flow.
- E. Condensate:
  - 1. Condensate pump kit.
  - 2. Secondary drain pan; Condensate overflow shut-off float switch and external alarm.
- F. Controls: Factory-wired to internal terminal strip or board for connection to programmable thermostat or Building Management System (BMS).

- G. Electrical: Furnish magnetic contactors. Arrange for single point electrical connection. Provide all associated field wiring.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install with required clearances and access for maintenance.
- B. Install factory furnished devices for field installation.
- C. Inspect for and remove shipping bolts, blocks and tie-down straps.
- D. After energizing units: Test units for proper fan rotation. Test and adjust controls and internal safeties. Replace malfunctioning units and retest.
- E. Thoroughly clean exposed portions of equipment. Install new filters prior to final test and balance and again prior to final acceptance.

#### **3.2 DUCTLESS SPLIT SYSTEMS - COOLING ONLY INSTALLATION**

- A. Condensate piped to indirect waste connection; cleanouts at changes of direction; sized and sloped to drain per Code. Secondary drain routed to visible location.

#### **3.3 SPLIT SYSTEM INDOOR FAN COIL UNIT INSTALLATION**

- A. Provide Seismic restraint.
- B. Condensate piped to indirect waste connection; cleanouts at changes of direction; sized and sloped to drain per Code. Secondary drain pan with float switch.

**END OF SECTION**

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**SECTION 26 00 00**

**ELECTRICAL BASIC REQUIREMENTS**

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**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Work included in 26 00 00, Electrical Basic Requirements applies to Division 26, Electrical work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electrical systems for proposed project.
- B. Contract Documents include, but are not limited to, Specifications including, Drawings, Addenda, Owner/Engineer 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 items 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, and approved by the Engineer prior to submitting bids for substituted items.
  - 5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's representative, and other reviewing entity whose approval is required to obtain systems acceptance.

**1.2 RELATED SECTIONS**

- A. Contents of Section applies to Division 26, Electrical Contract Documents.
- B. Related Work:
  - 1. Additional conditions apply to this Division including, but not limited to:
    - a. Drawings
    - b. Addenda

- c. Owner/Engineer Agreement
- d. Owner/Contractor Agreement
- e. Codes, Standards, Public Ordinances and Permits

### 1.3 REFERENCES AND STANDARDS

- A. References and Standards per individual Division 26, Electrical 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. ANSI - American National Standards Institute
  - 4. APWA - American Public Works Association
  - 5. ASTM - ASTM International
  - 6. CFR - Code of Federal Regulations
  - 7. DSA - Division of State Architect
  - 8. EPA - Environmental Protection Agency
  - 9. ETL - Electrical Testing Laboratories
  - 10. FCC - Federal Communications Commission

11. FM - FM Global
12. IBC - International Building Code
13. IEC - International Electrotechnical Commission
14. IEEE - Institute of Electrical and Electronics Engineers
15. ISO - International Organization for Standardization
16. MSS - Manufacturers Standardization Society
17. NEC - National Electric Code
18. NECA - National Electrical Contractors Association
19. NEMA - National Electrical Manufacturers Association
20. NETA - National Electrical Testing Association
21. NFPA - National Fire Protection Association
22. OSHA - Occupational Safety and Health Administration
23. UL - Underwriters Laboratories Inc.

- D. See Division 26, Electrical individual Sections for additional references.
- E. 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.
- F. 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.

#### 1.4 SUBMITTALS

- A. See individual Division 26, Electrical 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. In addition:
  1. "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.

2. 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 zip file per specification division containing a separate file for each Specification Section. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Engineer. Deviations will be returned without review.
3. Product Data: Provide manufacturer's descriptive literature for products specified in Division 26, Electrical Sections.
4. 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.
  - a. 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 items. Highlight connections by/to other trades.
  - b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 26, Electrical specification Sections for specific items required in product data submittal outside of these requirements.
  - c. See Division 26, Electrical individual Sections for additional submittal requirements outside of these requirements.
5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. 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.
7. 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 Part 3 of this Section.

8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 26, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
10. Substitutions and Variation from Basis of Design:
  - a. 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.
  - b. 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.
11. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 26, Electrical specification Sections for additional requirements for shop drawings outside of these requirements.
  - a. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
12. Samples: Provide samples when requested by individual Sections.
13. Resubmission Requirements:
  - a. 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. Cloud changes in the submittals.

- b. Resubmit for review until review indicates no exception taken or "make corrections as noted".

14. Operation and Maintenance Manuals, Owners Instructions:

- a. Submit, at one time, electronic files (PDF format) on DVD of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. 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.
  - 1) 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.
  - 2) 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, quantities, relevant to each piece of equipment.
  - 3) Include Warranty per Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
  - 4) Include product certificates of warranties and guarantees.
  - 5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
  - 6) Include commissioning reports.
  - 7) Include copy of startup and test reports specific to each piece of equipment.
  - 8) 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.
- b. 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 26 00 00, Electrical Basic Requirements, Demonstration.
- c. 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.

15. Record Drawings:

- a. 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 conduit, and location of concealed electrical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
- b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
- c. 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.
- d. See Division 26, Electrical individual Sections for additional items to include in record drawings.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations.
- B. 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. distribution equipment, etc.) 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, and electrical systems.
- C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer, in writing, before starting work.
- D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.
- E. Provide products that are UL listed.

1.6 WARRANTY

- A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
- B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under the General Conditions. Confirm requirements in all Contract Documents.

## 1.7 COORDINATION DOCUMENTS

- A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, cable tray and electrical services with other trades (including ceiling suspension and tile systems), and provide maintenance access requirements. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.
- B. Advise Engineer in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Engineer of conflict.
- C. Verify in field exact size, location, and clearances regarding existing material, equipment and apparatus, and advise Engineer of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.
- D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide like items from one manufacturer.

### 2.2 MATERIALS

- 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 approved or have adequate approval or be acceptable by state, county, and city authorities. Equipment/fixture supplier is responsible for obtaining State, County, and City acceptance on equipment/fixtures that are not UL approved or are not listed for installation.
- B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.
- C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.
- D. 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

Engineer. Hazardous materials will be removed by Owner under separate contract.

## 2.3 ACCESS PANELS

- A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.
- B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 26, Electrical Sections. In the absence of specific requirements, comply with the following:
  - 1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
    - a. Ceiling access panels to be minimum of 24-inch by 24-inch.
    - b. Wall access panels to be minimum of 12-inch by 12-inch.
    - c. Provide screwdriver operated catch.
    - d. Manufacturers and Models:
      - 1) Drywall: Karp KDW.
      - 2) Plaster: Karp DSC-214PL.
      - 3) Masonry: Karp DSC-214M.
      - 4) 2 hour rated: Karp KPF-350FR.
      - 5) Manufacturers: Milcor, Elmdor, Acudor, or approved equivalent.

## PART 3 - EXECUTION

### 3.1 ACCESSIBILITY AND INSTALLATION

- A. Confirm Accessibility and Installation requirements in Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
- B. Install equipment requiring access (i.e., junction boxes, power supplies, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in passageways, doorways, scuttles or crawlspaces which would impede or block the 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 requirements in individual Division 26, Electrical Sections and the following:
  - a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

E. Plenums:

1. In plenums, provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Engineer of discrepancy.

F. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

G. Provide miscellaneous supports/metals required for installation of equipment and conduit.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in individual Division 26 Electrical Sections.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical 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 conduit 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.

C. Final Punch:

1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Electrical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch

visit from the Engineer, upon Engineer's acceptance that the mechanical systems are ready for final punch.

2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

### 3.4 CONTINUITY OF SERVICE

A. Confirm requirements individual Division 26, Electrical Sections and the following:

1. During remodeling or addition to existing structure, while existing structure is occupied, present 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 wiring, 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 to a minimum.
  - a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
4. No interruption of services to any part of existing facilities will be permitted without express permission in each instance from Owner. Requests for outages must state specific dates, hours and maximum durations, with outages kept to these specific dates, hours and maximum durations. Obtain written permission from Owner for any interruption of power, lighting or signal circuits and systems.
  - a. Organize work to minimize duration of power interruption.
  - b. Coordinate utility service outages with utility company.

### 3.5 CUTTING AND PATCHING

A. Confirm requirements in individual Division 26, Electrical Sections and the following:

1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to 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 for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
2. 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.



3. 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.
4. 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, paving, and/or walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

### 3.6 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.

### 3.7 DELIVERY, STORAGE AND HANDLING

- A. Confirm requirements in individual Division 26, Electrical Sections and the following:
  1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage and handling to be replaced before installation.
  2. Protect equipment to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
  3. Protect bus duct and similar items until in service.

### 3.8 DEMONSTRATION

- A. Confirm Demonstration requirements in individual Division 26, Electrical Sections.
- B. Upon completion of work and adjustment of equipment, test systems and demonstrate to Owner's Representative 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 Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical 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.



### 3.9 CLEANING

- A. Confirm Cleaning requirements in Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
- B. Upon completion of installation, thoroughly clean electrical equipment, removing dirt, debris, dust, temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

### 3.10 INSTALLATION

- A. Confirm Installation requirements in Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
- B. Install equipment and fixtures 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, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
- D. Provide miscellaneous supports/metals required for installation of equipment.

### 3.11 PAINTING

- A. Confirm requirements in individual Division 26, Electrical Sections and the following:
  - 1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces (i.e., hangers, hanger rods, equipment stands, etc.) with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
  - 2. In Electrical Room, on roof or other exposed areas, equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel.
  - 3. See individual equipment Specifications for other painting.
  - 4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
  - 5. Conduit: Clean, primer coat and paint interior/exterior conduit exposed in public areas with two coats paint suitable for metallic surfaces.
  - 6. Covers: Covers such as manholes, vaults and the like will be furnished with finishes which resist corrosion and rust.

### 3.12 ACCESS PANELS

- A. Confirm Access Panel requirements in Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
  - 1. Coordinate locations/sizes of access panels with Architect prior to work.

### 3.13 ACCEPTANCE

- A. Confirm requirements in individual Division 26, Electrical Sections and the following:
  - 1. System cannot be considered for acceptance until work is completed and demonstrated to Engineer that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
    - a. Cleaning
    - b. Operation and Maintenance Manuals
    - c. Training of Operating Personnel
    - d. Record Drawings
    - e. Warranty and Guaranty Certificates
    - f. Start-up/Test Document and Commissioning Reports

### 3.14 FIELD QUALITY CONTROL

- A. Confirm Field Quality Control requirements in Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
- B. Tests:
  - 1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
  - 2. During site evaluations by Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

### 3.15 LETTER OF CONFORMANCE

- A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that Electrical 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 SALVAGED EQUIPMENT AND RECYCLED MATERIAL

- A. Salvage the following equipment not being reused and return to Owner:
  - 1. Breakers
- B. Electrical equipment that cannot be salvaged for reuse sell/give to recycling company. Recycle following excess, removed, or demolished electrical material:
  - 1. Copper or aluminum conductors, buses, and motor/transformer windings.
  - 2. Steel and aluminum from raceways, boxes, enclosures, and housings.
  - 3. Acrylic and glass from luminaire lenses/refractors.
- C. Provide separate on-site storage space for recycled and salvaged material. Clearly label space.
- D. Confirm additional salvaged equipment and recycled materials in the Contract Documents.

**END OF SECTION**

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**SECTION 26 05 01**

**ELECTRICAL DEMOLITION**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Materials and Equipment

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**PART 2 - PRODUCTS**

**2.1 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Verify that field measurements and circuiting arrangements are as shown on Drawings.

- B. Determine the exact location of existing utilities and equipment before commencing work, compensate the Owner for damages caused by the failure to locate and preserve utilities. Replace damaged items with new material to match existing.
- C. Verify that abandoned wiring and equipment serve only abandoned facilities.
- D. Demolition drawings are based on casual field observation and existing record documents.
  - 1. Verify the accuracy of the information shown prior to bidding and provide such labor and material as is necessary to accomplish the work.
  - 2. Verify location and number of electrical outlets in the field.
- E. Report discrepancies to Owner before disturbing existing installation.
- F. Report discrepancies to Architect before disturbing existing installation.
- G. Beginning of demolition means installer accepts existing conditions without exception.

### 3.2 PREPARATION

- A. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access, and access to different areas. The Owner will cooperate to the best of their ability to assist in a coordinated schedule, but will remain the final authority as to time of work permitted.
- B. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- C. Coordinate utility service outages with utility company.
- D. Interruption of services (power, telephone, fire alarm, communication systems) to existing facilities: not permitted without express permission in each instance from the Owner.
  - 1. Requests for service outages: State specific dates, hours and the maximum duration.
  - 2. Written permission: Obtain from Owner for interruption of power, lighting or signal circuits and systems.
  - 3. Organize the work to minimize duration of service interruptions.
  - 4. Provide temporary wiring and connections to maintain existing systems in service during construction.
- E. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

### 3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.

- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- E. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- F. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- G. Reroute wiring clear of demolition which serve existing outlets that remain and reconnect back to source.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- J. Furred out walls/columns: extend circuiting and outlets.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

### 3.4 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
- C. Luminaires to remain: Remove luminaires for cleaning. Use mild detergent to clean exterior and interior surfaces; rinse with clean water and wipe dry. Replace broken electrical parts.

### 3.5 SALVAGED EQUIPMENT AND RECYCLED MATERIAL

- A. Salvage the following equipment not being reused and return to Owner:
  - 1. Luminaires
  - 2. Breakers
- B. Salvage the following equipment not being reused and sell/give to electrical salvage company:
  - 1. Luminaires

2. Panelboards
  3. Breakers
  4. Transformers
- C. Electrical equipment that cannot be salvaged for reuse sell/give to recycling company. Recycle the following excess, removed, or demolished electrical material:
1. Copper or aluminum conductors, buses, motor/transformer windings, and the like.
  2. Steel and aluminum from raceways, boxes, enclosures, housings and the like.
  3. Acrylic and glass from luminaire lenses/refractors.
- D. Provide separate on-site storage space for recycled and salvaged material. Clearly label space.

**END OF SECTION**

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**SECTION 26 05 09**

**EQUIPMENT WIRING**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Equipment connections, whether furnished by Owner or other Divisions of the Contract.
2. Equipment grounding.

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition:
1. Verify equipment electrical characteristics with Drawings and equipment submittals prior to ordering equipment. Submit confirmation of this verification as a part of, or addendum to, the electrical product submittals.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements apply to this Section.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Materials and Equipment for Equipment Wiring: As specified in individual Sections.



## 2.2 GENERAL

- A. Safety Switches: Provide as required by CEC and as specified in Section 26 28 16, Enclosed Switches and Circuit Breakers.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Prior to submittal of product data for electrical distribution equipment, obtain and examine product data and shop drawings for equipment furnished by the Owner and by other trades on the project. Update the schedule of equipment electrical connections accordingly, noting proper ratings for overcurrent devices, fuses, safety disconnect switches, conduit and wiring, and the like. As a minimum, this requirement applies to equipment furnished by Owner and equipment furnished under Division 26.

### 3.2 INSTALLATION

- A. Do not install unrelated electrical equipment or wiring on equipment without prior approval of Engineer.
- B. Provide moisture tight equipment wiring and switches in plenums used for environmental air.
- C. Connect equipment complete from panel to equipment as required by code.
- D. Equipment:
  - 1. Provide appropriate cable and cord cap for final connection unless equipment is provided with same.

### 3.3 SYSTEMS STARTUP

- A. Provide field representative to prepare and start equipment.
- B. Adjust for proper operation within manufacturer's published tolerances.
- C. Demonstrate proper operation of equipment to Owner's designated representative.

**END OF SECTION**

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**SECTION 26 05 19**

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**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Lugs and Pads
  - 2. Wires and Cables
  - 3. Splices
  - 4. Connectors

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, provide:
  - 1. Cable insulation test reports in project closeout documentation.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Lugs and Pads:

1. Anderson
2. IlSCO
3. Panduit
4. Thomas & Betts
5. 3M
6. Or approved equivalent.

B. Wires and Cables:

1. General
  - a. Carol
  - b. General Cable
  - c. Okonite
  - d. Southwire
  - e. Or approved equivalent.

C. Splices:

1. Branch Circuit Splices:
  - a. Ideal
  - b. Scotch-Lock
  - c. 3M
  - d. Or approved equivalent.
2. Feeder Splices:
  - a. Not allowed.

D. Connectors:

1. Stranded conductors by Anderson.
2. Burndy
3. IlSCO
4. 3M

- 5. Thomas & Betts
- 6. Or approved equivalent.

## 2.2 LUGS AND PADS

- A. Ampacity: Cross-sectional area of pad for multiple conductor terminations to match ampere rating of panelboard bus or equipment line terminals.
- B. Copper Pads: Drilled and tapped for multiple conductor terminals.
- C. Lugs: Compression type for use with stranded branch circuit or control conductors; mechanical lugs for use with solid branch and feeder circuit conductors.

## 2.3 WIRES AND CABLES

- A. Copper, 600 volt rated throughout. Conductors 12 AWG and 10 AWG, solid.. Conductors 8 AWG and larger, stranded. 12 AWG minimum conductor size. Minimum insulation rating of 90 degrees C. Insulation Type: THWN-2, XHHW-2 or THHN-2.
- B. Phase color to be consistent at feeder terminations; A-B-C, top to bottom, left to right, front to back.
- C. Color Code Conductors as Follows:

PHASE	208 VOLT WYE	480 VOLT
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Gray or White w/colored strip
Ground	Green	Green

- D. MC Cable: Not allowed.
- E. AC Cable (Armored Cable): Not allowed.
- F. NMB Cable: Not allowed.

## 2.4 SPLICES

- A. Feeders: Compression barrel splice with two layers Scotch 23 and four layers Scotch 33+ as vapor barrier.

## 2.5 CONNECTORS

- A. Split bolt connectors not allowed.

- B. Conductor Branch Circuits: Wire nuts with integral spring connectors for conductors 12 AWG through 8 AWG. Push-in type connectors where conductors are not required to be twisted together are not acceptable.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install per manufacturer instructions and CEC.
- B. Field Quality Control:
  - 1. Test conductor insulation on feeders of 100 amp and greater for conformity with 1000 volt megohmmeter. Use Insulated Cable Engineers Association testing procedures. Minimum insulation resistance acceptable is 1 megohm for systems 600 volts and below. Notify Engineer if insulation resistance is less than 1 megohm.
  - 2. Test Report: Prepare a typed tabular report indicating the testing instrument, the feeder tested, amperage rating of the feeder, insulation type, voltage, the approximate length of the feeder, conduit type, and the measured resistance of the megohmmeter test. Submit test reports with project closeout documents.
  - 3. Inspect and test in accordance with NETA Standard ATS, except Section 4.
  - 4. Perform inspections and tests listed in NETA Standard ATS, Section 7.3.2.

#### **3.2 LUGS AND PADS**

- A. Thoroughly clean surfaces to remove all dirt, oil, great or paint.
- B. Use torque wrench to tighten per manufacturer's directions.

#### **3.3 WIRES AND CABLES**

- A. General:
  - 1. Do not install or handle thermoplastic insulated wire and cable in temperatures below +14 degrees F (-10 C).
  - 2. Install conductors in raceways having adequate, code size cross-sectional area for wires indicated.
  - 3. Install conductors with care to avoid damage to insulation.
  - 4. Do not apply greater tension on conductors than recommended by manufacturer during installation.
  - 5. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation. Do not use pulling

compounds for installation of conductors connected to GFCI circuit breakers or GFCI receptacles.

6. Conductor Size and Quantity:
  - a. Install no conductors smaller than 12 AWG unless otherwise shown.
  - b. Provide required conductors for a fully operable system.
7. Provide dedicated neutrals (one neutral conductor for each phase conductor) in all 120V circuits
8. Conductors in Cabinets:
  - a. Cable and tree wires in panels and cabinets for power and control. Use plastic ties in panels and cabinets.
  - b. Tie and bundle feeder conductors in wireways of panelboards.
  - c. Hold conductors away from sharp metal edges.
9. Homeruns:
  - a. Do not change intent of branch circuit homeruns without approval. Homeruns for 20A branch circuits may be combined to a maximum of six current carrying conductors including neutral conductors in homeruns. Apply derating factors as required per NEC. Increase conductor size as needed.
10. Identify wire and cable under the provisions of Section 26 05 53, Identification for Electrical Systems. Identify each conductor with its panel and circuit number as indicated.
11. Exposed cable is not allowed.

### 3.4 SPLICES

- A. Make up slices complete and promptly after wire installation. Provide single wire pigtails for luminaire and device connections. Wire nuts may be used for luminaire wire connections to single wire circuit conductor pigtails.
- B. Make splices for No. 8 and larger wires with mechanically applied pressure type connectors. Make all taped joints with Scotch 33+ or equal, applied in half-lap layers without stretching to deform.
- C. Remove insulation with a stripping tool designed specifically for that purpose. A pocket knife is not an acceptable tool. Leave all conductors nick-free.

### 3.5 CONNECTORS

- A. Install to assure a solid and safe connection.

- B. Do not connect copper and aluminum wiring without UL listed connectors that are listed for the purposes.

**END OF SECTION**

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**SECTION 26 05 26**

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**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Connectors and Accessories
  - 2. Grounding Conductor

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, provide:
  - 1. Test reports of ground resistance for service and separately derived system grounds.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, meet the following:
  - 1. Comply with the requirements of ANSI/NFPA 70.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Connectors and Accessories:



1. Burndy Hyground Compression System
2. Erico/Cadweld
3. Amp Ampact Grounding System
4. Pipe Grounding Clamp:
  - a. Burndy GAR Series
  - b. O Z Gedney
  - c. Thomas & Betts
  - d. Or approved equivalent.

**B. Grounding Conductor**

1. Carol
2. General Cable
3. Okonite
4. Southwire
5. Or approved equivalent

**2.2 CONNECTORS AND ACCESSORIES**

- A. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors.
- B. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.

**2.3 GROUNDING CONDUCTOR**

- A. Grounding Electrode Conductor: Soft-draw bare stranded copper for wire sizes larger than #10 AWG Bare. Solid copper for wire sizes #10 AWG and smaller.
- B. Equipment Grounding Conductor: Green insulated, insulation type to match that of associated feeder or branch circuit wiring, size as indicated on drawings.

**PART 3 - EXECUTION**

**3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Verify site conditions prior to beginning work.
- B. Bond Sections of service equipment enclosure to service ground bus.

- C. Separately Derived Systems: Ground each separately derived system per NEC Article 250.
- D. Bond together reinforcing steel and metal accessories in pool and fountain structures.
- E. Corrosion inhibitors: Apply a corrosion inhibitor to contact surfaces when making grounding and bonding connections. Use corrosion inhibitor appropriate for protecting a connection between metals used.
- F. Grounding system resistance to ground not to exceed 25 ohms. Make necessary modifications or additions to grounding electrode system for compliance. Submit final tests to assure that this requirement is met.
- G. Inspect and test in accordance with NETA Standard ATS, Except Section 4.
- H. Perform inspections and tests listed in NETA Standard AB, Section 7.13.

### 3.2 CONNECTORS AND ACCESSORIES INSTALLATION

- A. Install per manufacturer's instructions.

### 3.3 GROUNDING CONDUCTOR INSTALLATION

- A. Raceways:
  - 1. Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger equipment grounding conductor is included with circuit, use grounding bushing with lay-in lug.
  - 2. Connect metal raceways, which terminate within an enclosure but without mechanical connection to enclosure, by grounding bushings and ground conductor to grounding bus.
  - 3. Where equipment supply conductors are in flexible metallic conduit, install stranded copper equipment grounding conductor from outlet box to equipment frame.
  - 4. Install equipment grounding conductor, code size minimum unless noted on drawings, in metallic and nonmetallic raceway systems.
- B. Feeders and Branch Circuits:
  - 1. Provide continuous green insulated copper equipment grounding conductors for feeders and branch circuits.
  - 2. Where installed in a continuous solid metallic raceway system and larger sizes are not detailed, provide insulated equipment grounding conductors for feeders and branch circuits sized in accordance with the latest adopted edition of NEC Article 250, Table 250-122.

- C. Bond boxes, cabinets, enclosures and panelboard equipment grounding conductors to enclosure with specified conductors and lugs. Install lugs only on thoroughly cleaned contact surfaces.
- D. Equipment and Appliances: Install code size equipment grounding conductor to equipment frame or manufacturer's designated ground terminal.

**END OF SECTION**

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**SECTION 26 05 29**

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**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS AND EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Anchors, Threaded Rod and Fasteners
  - 2. Support Channel, Hangers and Supports

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals not required for this Section.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, meet the following:
  - 1. Manufacturers regularly engaged in the manufacture of bolted metal framing support systems, whose products have been in satisfactory use in similar service for not less than 10 years.
  - 2. Support systems to be supplied by a single manufacturer.
  - 3. Engineering Responsibility: Design and preparation of Shop Drawings and calculations for each multiple pipe support, trapeze, equipment hangers/supports, and seismic restraint by a qualified Structural Professional Engineer.
    - a. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of hangers and supports that are similar to those indicated for this Project in material, design, and extent.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

## 1.7 PERFORMANCE REQUIREMENTS

- A. General: Provide conduit and equipment hangers and supports in accordance with the following:
  - 1. When supports, anchorages, and seismic restraints for equipment and supports, anchorages and seismic restraints for conduit, cable tray and equipment are not shown on the Drawings, the Contractor is responsible for their design.
  - 2. Connections to structural framing shall not introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.
- B. Engineered Support Systems: The following support systems to be designed, detailed, and bear the seal of a professional engineer registered in the State of California.
  - 1. Support frames such as conduit racks or stanchions for conduit and equipment which provide support from below.
  - 2. Equipment and piping support frame anchorage to supporting slab or structure.
- C. Provide channel support systems, for conduits to support multiple conduits capable of supporting combined weight of support systems and system contents.
- D. Provide heavy-duty steel trapezes for piping to support multiple conduit capable of supporting combined weight of supported systems and system contents.
- E. Provide seismic restraint hangers and supports for conduit and equipment.
- F. Obtain approval from AHJ for seismic restraint hanger and support system to be installed for piping and equipment.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Anchors, Threaded Rod and Fasteners:
  - 1. Anchor It
  - 2. Epcon System
  - 3. Hilti-Hit System
  - 4. Power Fast System

5. Or approved equivalent.
- B. Support Channel, Hangers and Supports:
  1. B-Line
  2. Kindorf
  3. Superstrut
  4. Unistrut
  5. Or approved equivalent.

## 2.2 ANCHORS, THREADED ROD AND FASTENERS

- A. Anchors, Threaded Rod and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
- B. Concrete Inserts: Cast in concrete for support fasteners for loads up to 800 lbs.
- C. Anchor Bolts for Area Luminaire Poles: As supplied by area luminaire pole manufacturer.
- D. Anchors and Fasteners:
  1. Do not use powder-actuated anchors.
  2. Obtain permission from Engineer before using powder-actuated anchors.
  3. Concrete Structural Elements: Use precast inserts.
  4. Steel Structural Elements: Use beam clamps.
  5. Concrete Surfaces: Use self-drilling anchors.
  6. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
  7. Solid Masonry Walls: Use expansion anchors.
  8. Sheet Metal: Use sheet metal screws.
  9. Wood Elements: Use wood screws.
- E. Fasteners: Provide fasteners of types as required for assembly and installation of fabricated items; surface-applied fasteners are specified elsewhere.
- F. Bolts: Low carbon steel externally and internally threaded fasteners conforming with requirements of ASTM A307; include necessary nuts and plain hardened washers. For structural steel elements supporting mechanical material or equipment from

building structural members or connection thereto, use fasteners conforming to ASTM A325.

- G. Miscellaneous Materials: Provide incidental accessory materials, tools, methods, and equipment required for fabrication.

## 2.3 SUPPORT CHANNEL, HANGERS AND SUPPORTS

- A. Hangers and Supports - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
  - 1. Channel Material: Carbon steel.
  - 2. Coating: Hot dip galvanized.
- B. Pipe Straps: Two-hole galvanized or malleable iron.
- C. Miscellaneous Metal: Provide miscellaneous metal items specified hereunder, including materials, fabrication, fastenings and accessories required for finished installation, where indicated on Drawings or otherwise not shown on drawings that are necessary for completion of the project. The Contractor is responsible for their design.
  - 1. Fabricate miscellaneous units to size shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
- D. Structural Shapes: Where miscellaneous metal items are needed to be fabricated from structural steel shapes and plates, provide members constructed of steel conforming with requirements of ASTM A36 or approved equivalent.
- E. Steel Pipe: Provide seamless steel pipe conforming to requirements of ASTM A53, Type S, Grade A, or Grade B. Weight and size required as specified.
- F. Miscellaneous Materials: Provide incidental accessory materials, tools, methods, and equipment required for fabrication.

## PART 3 - EXECUTION

### 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Fabrication - Miscellaneous Metals
  - 1. General: Verify dimensions prior to fabrication. Form metal items to accurate sizes and configurations as indicated on Drawings and otherwise required for proper installation; make with lines straight and angles sharp, clean and true; drill, countersink, tap, and otherwise prepare items for connections with work of other trades, as required. Fabricate to detail of structural shapes, plates and

bars; weld joints where practicable; provide bolts and other connection devices required. Include anchorages; clip angles, sleeves, anchor plates, and similar devices. Hot dipped galvanize after fabrication items installed in exterior locations. Set accurately in position as required and anchor securely to building construction. Construct items with joints formed for strength and rigidity, accurately machining for proper fit; where exposed to weather, form to exclude water.

2. Finishes:

- a. Ferrous Metal: After fabrication, but before erection, clean surfaces by mechanical or chemical methods to remove rust, scale, oil, corrosion, or other substances detrimental to bonding of subsequently applied protective coatings. For metal items exposed to weather or moisture, galvanize in manner to obtain G90 zinc coating in accordance with ASTM A123. Provide other non-galvanized ferrous metal with one coat of approved rust-resisting paint primer, in manner to obtain not less than 1.0 mil dry film thickness. Touch-up damaged areas in primer with same material, before installation. Apply zinc coatings and paint primers uniformly and smoothly; leave ready for finish painting as specified elsewhere.
- b. Metal in contact with Concrete, Masonry and Other Dissimilar Materials: Where metal items are to be erected in contact with dissimilar materials, provide contact surfaces with coating of an approved zinc-chromate primer in manner to obtain not less than 1.0 mil dry film thickness, in addition to other coatings specified in these specifications.
- c. For Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

3.2 ANCHORS, THREADED ROD AND FASTENERS INSTALLATION

- A. Safety factor of 4 required for every fastening device or support for electrical equipment installed. Supports to withstand four times the weight of equipment it supports.
- B. Do not use other trade's fastening devices as supporting means for electrical equipment or materials.
- C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- D. Do not use supports or fastening devices to support other than one particular item.
- E. Securely suspend junction boxes, pull boxes or other conduit terminating housings located above suspended ceiling from floor above or roof structure to prevent sagging and swaying.
- F. Provide seismic bracing per CBC requirements.



- G. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- H. Use spring lock washers under fastener nuts for strut.
- I. Cutting and Drilling
  - 1. Do not drill or cut structural members without prior permission from Engineer.

### 3.3 SUPPORT CHANNEL, HANGERS AND SUPPORTS INSTALLATION

- A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.
- B. Safety factor of 4 required for every fastening device or support for electrical equipment installed. Supports to withstand four times the weight of equipment it supports.
- C. Verify mounting height of luminaires prior to installation when heights are not detailed.
- D. Install vertical support members for equipment and luminaires, straight and parallel to building walls.
- E. Install horizontal support members straight and parallel to ceilings or finished floor unless otherwise noted.
- F. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceiling, walls or in void spaces or over suspended ceilings.
- G. Do not use other trade's fastening devices as supporting means for electrical equipment or materials.
- H. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- I. Do not use supports or fastening devices to support other than one particular item.
- J. Support conduits within 18-inches of outlets, boxes, panels, cabinets and deflections unless more stringently required by CEC.
- K. Maximum distance between supports not to exceed 8 foot spacing unless otherwise required by CEC.
- L. Support flexible conduits within 12-inches of outlets, boxes, panels, cabinets and deflections unless otherwise required by CEC.
- M. Maximum distance between supports for flexible conduits not to exceed 48-inches spacing unless otherwise required by CEC.
- N. Maximum distance between supports for rigid PVC conduits unless otherwise required by CEC is as follows:

1. 1/2-inch or 3/4-inch and 1-inch conduit, 3-feet apart.
  2. 1-1/4-inch or 1-1/2-inch and 2-inch conduit, 4-feet apart.
  3. 2-1/2-inch and 3-inch conduit, 5-feet apart.
  4. 4-inch and 5-inch conduit, 6-feet apart.
  5. 6-inch conduit, 7-feet apart.
- O. Maximum distance between supports for auxiliary gutters and wireways unless otherwise required by CEC is as follows:
1. Sheet metal auxiliary gutters and wireways - 4-feet apart horizontally and 10-feet vertically.
  2. Non-metallic auxiliary gutters and wireways - 30-inches apart horizontally and 3-feet vertically.
- P. Install strut hangers as instructed by strut manufacturer. Suspended strut hangers as instructed by strut manufacturer for the load, with a maximum spacing of 8-feet on center and within 2-feet of outlet box, cabinet, junction box or other channel raceway termination unless otherwise required by CEC.
- Q. Coordinate routing of conduit racks with materials and equipment installed by other trades. Where conduit racks are exposed to view, coordinate location and installation with Engineer for optimal appearance.
- R. Securely suspend junction boxes, pull boxes or other conduit terminating housings located above suspended ceiling from floor above or roof structure to prevent sagging and swaying.
- S. Provide seismic bracing per CBC requirements.
- T. Where service disconnects are mounted on building exterior, physically attach service disconnect to the building or structure served.
- U. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- V. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- W. Wet and Damp Locations:
1. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1-inch off wall.

**END OF SECTION**

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**SECTION 26 05 33**

**RACEWAYS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Rigid Metal Conduit (RMC)
  - 2. Electrical Metallic Tubing (EMT)
  - 3. Flexible Metal Conduit (FMC)
  - 4. Conduit Fittings
- B. Provide a complete system of conduit and fittings, with associated couplings, connectors, and fittings, as shown on drawings and described in these specifications.

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.
- B. In addition, reference the following:
  - 1. Section 26 05 29, Hangers and Supports for Electrical Systems and Equipment
  - 2. Section 26 05 34, Boxes

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

## 1.7 DEFINITIONS

- A. Raceway system is defined as consisting of conduit, tubing, duct, and fittings including but not limited to connectors, couplings, offsets, elbows, bushings, expansion/deflection fittings, and other components and accessories. Complete electrical raceway installation before starting the installation of conductors and cables.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Rigid Metal Conduit (RMC):
  - 1. Allied Tube & Conduit
  - 2. Beck Manufacturing Inc.
  - 3. Picoma
  - 4. Wheatland Tube Company
  - 5. Or approved equivalent.
- B. Electrical Metallic Tubing (EMT):
  - 1. Allied Tube & Conduit
  - 2. Beck Manufacturing WL
  - 3. Picoma
  - 4. Wheatland Tube Company
  - 5. Or approved equivalent.
- C. Flexible Metal Conduit (FMC):
  - 1. AFC Cable Systems Inc.
  - 2. Electri-Flex Company
  - 3. International Metal Hose
  - 4. Or approved equivalent.
- D. Conduit Fittings:
  - 1. Bushings:
    - a. Insulated type for Threaded Rigid or EMT without Factory Installed Plastic Throat Conductor Protection:
      - 1) Thomas & Betts 1222 Series

- 2) O-Z Gedney B Series
    - 3) Or approved Equivalent.
  2. Raceway Connectors and EMT Couplings:
    - a. Thomas & Betts Series
    - b. O-Z Gedney Series
    - c. Or approved Equivalent.
  3. Expansion/Deflection Fittings:
    - a. EMT, O-Z Gedney Type TX
    - b. RMC, O-Z Gedney Type AX, DX and AXDX, Crouse & Hinds XD
    - c. Or approved equivalent.
- 2.2 RIGID METAL CONDUIT (RMC)
- A. UL 6, ANSI C80.1. Hot dipped galvanized steel conduit after thread cutting.
    1. Fittings: NEMA FB2.10.
- 2.3 ELECTRICAL METALLIC TUBING (EMT)
- A. Description: UL 797, ANSI C80.3; steel galvanized tubing.
  - B. Fittings: NEMA FB 1; steel, compression type.
- 2.4 FLEXIBLE METAL CONDUIT (FMC)
- A. Description: UL 1, Interlocked steel construction.
  - B. Fittings: NEMA FB 2.20.
- 2.5 CONDUIT FITTINGS
- A. Bushings:
    1. Insulated type for Threaded Rigid Conduit or Raceway Connectors without factory-installed plastic throat conductor protection.
    2. Insulated grounding type for Threaded Rigid Conduit and Conduit Connectors.
  - B. Raceway Connectors and EMT Couplings:
    1. Steel connectors, couplings, and conduit bodies, with hot-dip galvanized.
    2. Connector locknuts are steel, with threads meeting ASTM tolerances. Locknuts are hot-dip galvanized.

3. Connector throats (EMT, flexible conduit, metal clad cable and cordset connectors) have factory installed plastic inserts permanently installed. For normal cable or conductor exiting angles from raceway, the cable jacket or conductor insulation bears only on plastic throat insert.
4. Steel gland, Tomic or Breagle connectors and couplings are recognized for this Contract as having acceptable raceway to fitting electrical conductance.
5. Set screw connectors and couplings, without integral compression glands, are recognized for this contract as not having acceptable raceway to fitting electrical conductance. A ground conductor sized per this Specification must be included and bonded within raceway assembly utilizing this type connector or coupling.

C. Provide expansion/deflection fittings for EMT.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Finished Surfaces: Schedule raceway installation to avoid conflict with installed wall and ceiling surfaces. If unavoidable, coordinate work and repairs with Engineer.
- B. Conduit Size:
  1. Minimum Size: 3/4-inch for power and control, unless otherwise noted.
- C. Provide two pull strings/tapes in empty conduits. Types:
  1. Feeders: Polyester measure/pulling tape, Greenlee 4436 or approved.
  2. Branch circuits and low voltage: Greenlee Poly Line 431 or approved.
  3. If fish tape is used for pulling line or low voltage wiring, fiberglass type to be used. Metal fish tapes will not be allowed.
  4. Secure pull string/tape at each end.
  5. Provide caps on ends of empty conduit to be used in future.
  6. Label both ends of empty conduits with location of opposite end.
- D. Elbow for Low Energy Signal Systems: Use long radius factory ells where linking sections of raceway for installation of signal cable.
- E. Verify that field measurements are as shown on drawings.
- F. Plan locations of conduit runs in advance of the installation and coordinate with ductwork, plumbing, ceiling and wall construction in the same areas.
- G. Locate penetrations and holes in advance where they are proposed in the structural sections such as footings, beams, and walls. Penetrations are acceptable only when the following occurs:

1. As approved by the Structural Engineer prior to construction, and after submittal of drawing showing location, size, and position of each penetration.
- H. Verify routing and termination locations of conduit prior to rough-in.
- I. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.
- J. Install raceways securely, in neat and workmanlike manner, as specified in NECA 1, Standard Practices for Good Workmanship in Electrical Construction.
- K. Install steel conduit as specified in NECA 101, Standard for Installing Steel Conduits.
- L. Inserts, anchors and sleeves.
  1. Coordinate location of inserts and anchor bolts for electrical systems prior to concrete pour.
  2. Coordinate location of sleeves with consideration for other building systems prior to concrete pour.
- M. Conduit Supports:
  1. Arrange supports to prevent misalignment during wiring installation.
  2. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
  3. Group related conduits; support using conduit rack. Construct rack using steel channel. Provide space on each for 25 percent additional conduits.
  4. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
  5. Do not attach conduit to ceiling support wires.
- N. Flexible steel conduit length not-to-exceed 6-feet, 3-feet in concealed walls. Provide sufficient slack to reduce the effect of vibration.
- O. Install conduit seals at boundaries where ambient temperatures differ by 10 degrees F or more. Install seals on warm side of partition.
- P. Seal raceways stubbing up into electrical equipment. Plug raceways with conductors with duct-seal. Cap spare raceways and plug PVC raceway products with plastic plugs as made by Underground Products, or equal, shaped to fit snugly into the stubup.
- Q. Seal raceways penetrating an exterior building wall to prevent moisture and vermin from entering into the electrical equipment.
- R. Use suitable caps on spare and empty conduits to protect installed conduit against entrance of dirt and moisture.

- S. Keep 277/480 volt wiring independent of 120/208 volt wiring. Keep power wiring independent of communication system wiring.
- T. Keep emergency system wiring independent of other wiring systems per NEC 700.
- U. Arrange conduit to maintain headroom and present neat appearance.
- V. Do not install conduits on surface of building exterior, along vapor barrier, across roof, on top of parapet walls, or across floors, unless otherwise noted on drawings.
- W. Exposed conduits are permitted only in following areas:
  - 1. Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished material.
  - 2. Existing walls that are concrete or block construction.
  - 3. Where specifically noted on Drawings.
  - 4. Route exposed conduit parallel and perpendicular to walls, tight to finished surfaces and neatly offset into boxes.
- X. Do not install conduits or other electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block area passage's intended usage.
- Y. Install continuous conduit and raceways for electrical power wiring .
- Z. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- AA. Maintain adequate clearance between conduit and piping.
- AB. Keep conduits a minimum of 12-inches away from steam or hot water radiant heating lines (at or above 104 degrees F) or 3-inches away from waste or water lines.
- AC. Cut conduit square using saw or pipecutter; deburr cut ends.
- AD. Bring conduit to shoulder of fittings; fasten securely.
- AE. Use conduit hubs to fasten conduit to cast boxes in damp and wet locations.
- AF. Install no more than the equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one shot bender to fabricate factory elbows for bends in metal conduit larger than 2-inch size.
- AG. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- AH. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control, and expansion joints.



- AI. Conduit Terminations for Signal Systems: Provide a plastic bushing on the end of conduit used for signal system wiring.
- AJ. Feeders: Do not combine or change feeder runs.
- AK. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.
- AL. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing installation and installer.

### 3.2 RIGID METAL CONDUIT (RMC) INSTALLATION

- A. Outdoor Locations Above Grade: Use RMC.
- B. Damp Locations: RMC up to 2-inches in diameter.
- C. Dry Locations:
  - 1. Concealed: RMC.
  - 2. Exposed: RMC.
- D. Dry, Protected: RMC.
- E. In areas exposed to severe mechanical damage: RMC.
- F. In hazardous areas per CEC 501: RMC.

### 3.3 ELECTRICAL METALLIC TUBING (EMT) INSTALLATION

- A. Damp Locations: EMT up to 2-inches in diameter.
- B. Dry Locations:
  - 1. Concealed: EMT.
  - 2. Exposed: EMT.
- C. Dry, Protected: EMT.

### 3.4 FLEXIBLE METAL CONDUIT (FMC) INSTALLATION

- A. For Dry Areas: Equipment connections subject to movement or vibration, use flexible metallic conduit.
- B. Flexible Conduit: Install 12-inch minimum slack loop on flexible metallic conduit.

### 3.5 CONDUIT FITTINGS INSTALLATION

- A. Conduit Joints: Assemble conduits continuous and secure to boxes, panels, and equipment with fittings to maintain continuity. Provide watertight joints in damp

locations. Rigid conduit connections to be threaded, clean and tight (metal to metal). Threadless connections are not permitted for RMC. Seal conduits where penetrating below raised floor area.

- B. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- C. Use set screw type fittings only in dry locations. When set screw fittings are utilized provide insulated continuous equipment ground conductor in conduit, from overcurrent protection device to outlet.
- D. Use compression fittings in dry locations, damp and rain-exposed locations. Maximum size permitted in damp locations and locations exposed to rain is 2-inches in diameter.
- E. Use threaded type fittings in wet locations, and damp or rain-exposed locations where conduit size is greater than 2-inches.
- F. Use PVC coated, threaded type fittings in corrosive environments.
- G. Use PVC coated RMC 36-inch radius ells for power service conduits and 48-inch radius ells for telephone service conduits.
- H. Use insulated type bushings with ground provision at switchboards, panelboards, safety disconnect switches, junction boxes that have feeders 60 amperes and greater.
- I. Condulets and Conduit Bodies:
  - 1. Do not use condulets and conduit bodies in conduits for signal wiring, in feeders 100 amp and larger, or for conductor splicing.
- J. Sleeves and Chases - Floor, Ceiling and Wall Penetrations: Provide necessary rigid conduit sleeves, openings and chases where conduits or cables are required to pass through floors, ceilings or walls.
- K. Expansion Joints:
  - 1. Provide conduits crossing expansion joints where cast in concrete with expansion-deflection fittings, equivalent to OZ/Gedney AXDX, installed per manufacturers recommendations.
  - 2. Secure conduits 3-inches and larger to building structure on opposite sides of a building expansion joint with an expansion-deflection fitting across joint installed per manufacturer's recommendations.
  - 3. Provide conduits less than 3-inches where not cast in concrete with junction boxes securely fastened on both sides of expansion joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. In lieu of this flexible conduit, an expansion-deflection fitting, as indicated for conduits 3-inch and larger may be installed.

4. Verify expansion/deflection requirements with Structural Engineer prior to installation.
- L. Seismic Joints:
1. No conduits cast in concrete allowed to cross seismic joint.
  2. Provide conduits with junction boxes securely fastened on both sides of seismic joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. Prior to installation, verify with Engineer that 15-inches is adequate for designed movement, and if not, increase this length as required.
  3. Provide conduits less than 3-inches where not cast in concrete with junction boxes securely fastened on both sides of expansion joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. In lieu of this flexible conduit, an expansion-deflection fitting, as indicated for conduits 3-inch and larger may be installed.
- M. Provide rigid conduit coupling flush with surface of slab or wall for conduit stubbed in concrete slab or wall to serve electrical equipment or an outlet under table or to supply shop tool, etc. Provide plug where conduit is to be used in future.

**END OF SECTION**

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**SECTION 26 05 34**

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**BOXES**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Pull and Junction Boxes
2. Box Extension Adapter
3. Conduit Fittings

- B. Provide electrical boxes and fittings for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts and other necessary components.

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

- B. In addition, reference the following:

1. Section 26 05 33, Raceways
2. Section 26 05 53, Identification for Electrical Systems

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Pull and Junction Boxes:
  - 1. B-Line
  - 2. Hoffman
  - 3. Or approved equivalent.
- B. Box Extension Adapter:
  - 1. Hubbell
  - 2. Thomas & Betts
  - 3. Cooper/Crouse-Hinds
  - 4. Or approved equivalent.
- C. Conduit Fittings:
  - 1. O-Z Gedney
  - 2. Hubbell
  - 3. Thomas & Betts
  - 4. Cooper/Crouse-Hinds
  - 5. Or approved equivalent.

### **2.2 PULL AND JUNCTION BOXES**

- A. Construction: Provide ANSI 49 gray enamel painted sheet steel junction and pull boxes, with screw-on covers; of type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.
- B. Location:
  - 1. Provide junction boxes and pull boxes to facilitate installation of conductors and limiting accumulated angular sum of bends between boxes, cabinets and appliances to 270 degrees.
- C. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:
  - 1. Construction: Galvanized cast iron.
  - 2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.

3. Cover Legend: ELECTRIC.

D. Fiberglass Handholes: Die molded glass fiber hand holes:

1. Cable Entrance: Pre-cut 6- x 6-inch cable entrance at center bottom of each side.
2. Cover: Fiberglass weatherproof cover with nonskid finish.
3. Cover Legend: ELECTRIC.

## 2.3 BOX EXTENSION ADAPTER

- A. Construction: Diecast aluminum.
- B. Location: Install over flush wall outlet boxes to permit flexible raceway extension from flush outlet to fixed or movable equipment.

## 2.4 CONDUIT FITTINGS

- A. Requirements: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and plastic conduit bushings of the type and size to suit each respective use and installation.

# PART 3 - EXECUTION

## 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1, Standard Practice of Good Workmanship in Electrical Construction.
- B. Secure boxes rigidly to substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.
- C. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.
- D. Set wall mounted boxes at elevations to accommodate mounting heights specified in this Section.
- E. Electrical boxes are shown on drawings in approximate locations unless dimensioned.
  1. Adjust box locations up to 10-feet if required to accommodate intended purpose.
- F. Install boxes to preserve fire resistance rating of partitions and other elements, using code compliant materials and methods.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

- I. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12-inches of box.
- J. Box Color Coding and Marking: Reference Section 26 05 53, Identification for Electrical Systems.
- K. Adjust boxes to be parallel with building lines. Boxes not plumb to building lines are not acceptable.
- L. Install knockout closures in unused box openings.
- M. Clean interior of boxes to remove dust, debris, and other material.
- N. Clean exposed surfaces and restore finish.

### 3.2 PULL AND JUNCTION BOXES INSTALLATION

- A. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- B. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.
- C. Do not fasten boxes to ceiling support wires.
- D. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

### 3.3 BOX EXTENSION ADAPTER INSTALLATION

- A. Match material to box.
- B. Install gaskets at exterior and wet locations.

### 3.4 CONDUIT FITTINGS INSTALLATION

- A. Install set-screw fittings so the screws can be seen from below.
- B. Tighten compression fittings per manufacturer instructions.

**END OF SECTION**

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**SECTION 26 05 53**

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**IDENTIFICATION FOR ELECTRICAL SYSTEMS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Equipment Nameplates
  - 2. Device Labels
  - 3. Wire Markers

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals not required for this Section.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, meet the following:
  - 1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.
  - 2. Manufacturer's standard products of categories and types required for each application as referenced in other Division 26, Electrical Sections. Where more than a single type is specified for application, provide single selection for each product category.
  - 3. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices unless otherwise indicated.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.



## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Equipment Nameplates:
  - 1. B & I Nameplates
  - 2. Intellicum
  - 3. JBR Associates
  - 4. Or approved equivalent.
- B. Device Labels:
  - 1. Kroy
  - 2. Brady
  - 3. Or approved equivalent.
- C. Wire Markers:
  - 1. Brady
  - 2. Panduit
  - 3. Sumitomo
  - 4. Or approved equivalent.

### **2.2 EQUIPMENT NAMEPLATES**

- A. Engraved phenolic plastic, laminate, minimum 1/8-inch thick in the size indicated, with beveled edge border matching letter color. Federal specification L-P-387. All upper case letters in engraver standard letter style of the size and wording indicated. Punched for mechanical fastening, except where adhesive mounting is necessary due to substrate. Embossed tape style labels are not acceptable.
- B. Color:
  - 1. Normal (Utility): White letters on black background.
- C. Letter Size:
  - 1. Use 1/2-inch letters minimum for identifying major equipment and loads, including switchgear, switchboards, etc.
  - 2. Use 1/4-inch letters minimum for identifying panels, breakers, etc.

3. Use 3/16-inch minimum for identifying source, voltage, current, phase, and wire configurations.
- D. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.
- E. The Engineer and Owner reserve the right to make modifications to the nameplates as necessary.
- F. Locations:
  1. Branch panels.
  2. Distribution breakers in switchboards, and distribution panels.
  3. Equipment including, but not limited to, motor controllers, disconnects, and VFDs.
  4. Distribution transformers.

## 2.3 DEVICE LABELS

- A. Extra strength, laminated adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of electric vehicle charging stations. Indicate device name, source panel, and source circuits. Panel and circuit designation written in permanent marker on the back of the plate and inside the back-box. Do not provide punch tape style labels.
- B. Label all junction boxes to show system identification, source circuit, or raceway origin. In finished areas, utilize device label. In unfinished areas or above ceilings, use of permanent ink marker is acceptable.
- C. Where labels are provided, write identical information in permanent ink marker on the backside of the cover.

## 2.4 WIRE MARKERS

- A. Description: Vinyl-cloth self-adhesive type wire markers.
- B. Locations: Each conductor at panelboard gutters, pull boxes, junction boxes, and each load connection.
- C. Power Circuits: Branch circuit or feeder number as indicated on drawings and source panel.

# PART 3 - EXECUTION

## 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate designations used on Drawings with equipment nameplates and device labels.

- B. Install nameplates and labels parallel to equipment lines.
- C. Identify empty conduit and boxes with intended use.
- D. Provide typewritten branch panel schedules with protective clear transparent covers accounting for every breaker installed. Use actual room designations assigned by name or number near completion of the work, and not the designations shown on drawings.
- E. Where changes are made in existing panels, distribution boards, etc., provide new labeling and typewritten schedules to accurately reflect the changes.

### 3.2 EQUIPMENT NAMEPLATES

- A. Degrease and clean surfaces to receive nameplates.
- B. Secure equipment nameplates to equipment front using self-tapping stainless steel screws.
- C. Secure equipment nameplates to inside surface of door on panelboard that is recessed in finished locations.
- D. Verify emergency system distribution equipment nameplate colors with Owner.
- E. Panels to include name source, voltage, current phase, wire configuration and fault current rating. Transformers to include source KVA, and secondary voltage, phase, and wire configuration.
- F. Provide nameplates for flush mounted branch panelboards identifying name on front door. On inside of door provide nameplate as noted above. Verify with Owner if nameplate on outside of door is required.
- G. Provide a second label at branch panelboards listing the means of identification of branch circuit conductors. This identification legend to consist of the color code used for each voltage system (208Y/120V and 480Y/277V). See Specification Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables, for required conductor color code for this project. Include identification of both voltage systems on each label, regardless of the voltage of the panelboard to which the label is affixed. Comply with requirements of NEC 210.5.

### 3.3 DEVICE LABELS

- A. Reference 3.01, General Installation Requirements.
- B. Install per manufacturer's instructions and recommendations.
- C. Degrease and clean surfaces to receive labels.
- D. On the front of receptacle and switch finish plates, provide label with the circuit that each device is connected to.

3.4 WIRE MARKERS

- A. Reference 3.01, General Installation Requirements.
- B. Install per manufacturer's instructions and recommendations.
- C. Provide wire markers on each conductor for power.

**END OF SECTION**

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**SECTION 26 09 23**

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**OCCUPANCY AND VACANCY SENSORS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Occupancy/Vacancy Sensors (Ceiling and Wall mounted)
2. Combined Occupancy Sensor/Wall Switches ("Sensor/Switches")
3. Automatic Switches

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
1. Provide wiring diagrams indicating low voltage and line voltage wiring requirements.
  2. Provide, on reproducible architectural floor plan, a layout of sensors indicating their sensing distribution.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
1. Use manufacturer's published testing and adjusting procedures to adjust sensors time delay, daylight sensitivity, and passive infrared sensitivity to satisfaction of the Owner, in accordance with California Title 24 requirements.

2. Prepare and complete report of test procedures and results. Submit these test procedures and results to Owner and Architect.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Occupancy/Vacancy Sensors (Ceiling and Wall mounted):

1. Passive Infrared Occupancy/Vacancy Sensors:

- a. Sensor Switch
- b. WattStopper
- c. Leviton
- d. Hubbell
- e. Greengate
- f. Or approved equivalent.

2. Ultrasonic Occupancy/Vacancy Sensors:

- a. WattStopper
- b. Leviton
- c. Hubbell
- d. Greengate
- e. Sensor Switch
- f. Or approved equivalent.

3. Dual Technology Occupancy/Vacancy Sensors:

- a. WattStopper
- b. Leviton
- c. Hubbell
- d. Greengate
- e. Sensor Switch

- f. Or approved equivalent.
- B. Combined Occupancy/Vacancy Sensor:
  - 1. Sensor Switch
  - 2. WattStopper
  - 3. Leviton
  - 4. Hubbell
  - 5. Greengate
  - 6. Or approved equivalent.
- C. Automatic Switches:
  - 1. Sensor Switch
  - 2. WattStopper
  - 3. Leviton
  - 4. Hubbell
  - 5. Greengate
  - 6. Or approved equivalent.
- D. Basis of Design: Occupancy/Vacancy sensor layout on Drawings are designed based on WattStopper product line. Approved manufacturers listed are allowed on condition of meeting the specified conditions including complete sensor coverage of the area controlled and switching of luminaires in the area controlled. Provide additional sensors and power switch packs as needed to provide the same level of functionality as shown on Drawings or required in Specifications. Remove and replace electrical equipment installed not meeting these conditions at no cost to Owner.

## 2.2 GENERAL

- A. Occupancy sensor designation indicates sensors automatically turn lights ON when the sensor detects the presence of a person and will automatically turn lights OFF when no presence is detected for a specified amount of time (automatic-on and automatic-off).
- B. Vacancy sensor designation requires someone to manually turn the lights ON. The sensor will then automatically turn the lights OFF when no presence is detected for a specified amount of time (manual-on and automatic-off). These sensors must meet California Title 24 requirements.

- C. Provide occupancy sensors to sense presence of human activity within desired space and enable or disable on/off manual lighting control function provided by local switches.
- D. Upon detection of human activity by detector, sensor initiates time delay to maintain lights on for present period of time. Field adjustable time delay setting from 30 seconds to 15 minutes.
- E. Factory set sensors for maximum sensitivity.
- F. LED lamp built into sensor indicates when occupant is detected.
- G. Provide zero cross relay control with sensors and sensor/switched; relay contacts close and open with AC voltage signal is at zero.
- H. Where line voltage sensors and sensor/switches are used, provide to match voltage of controlled circuit.
- I. Line Voltage Sensors, Control Units, and Relays: UL listed.

## 2.3 OCCUPANCY/VACANCY SENSORS (CEILING AND WALL MOUNTED)

### A. Passive Infrared Sensors:

- 1. Sensor Function: Detects human presence in floor area being controlled by detecting changes in Infrared energy. Sensor detects small movements, i.e., when people are writing while seated at a desk.
- 2. Provide temperature compensated dual element pyro-electric sensor and with multi element Fresnel lens.
- 3. Sensor utilizes DIP switches for adjustment to time delay and override. Field adjustable settings for sensitivity.
- 4. Provide daylight filter to ensure that sensor is insensitive to short-wavelength infrared waves, i.e., those emitted by sun.
- 5. Adjustments and mounting hardware under removable cover to prevent tampering with adjustments and hardware.
- 6. Sensor utilizes advanced digital signal processing technology to reduce false offs without reducing sensitivity.
- 7. Ceiling-Mounted Sensor:
  - a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
  - b. 360 degree sensor range; coverage: 1200 SF, unless otherwise noted on drawings.



- c. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - d. Provide internal form C dry contacts for HVAC control.
  - e. Basis of Design: Wattstopper CI-300 Series.
8. Wall-Mounted Sensor:
- a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
  - b. 90 degree sensor range with dense wide angle lens; coverage: 1000 SF for desktop motion, unless otherwise noted on Drawings.
  - c. Swivel mounting bracket for corner mounting to wall or ceiling.
  - d. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - e. Provide internal form C dry contacts for HVAC control.
  - f. Basis of Design: Wattstopper CX Series.
9. Building Exterior Sensor:
- a. Capable of mounting on walls, eaves or ceilings.
  - b. On/off control based on daylight levels via adjustable light level setting.
  - c. Line Voltage: provide sensor to match voltage of lighting controlled; capable of switching up to 1000 watts ballast and incandescent load.
  - d. Adjustable time delay from 15 seconds to 15 minutes.
  - e. Silicon gasketed to prevent water and dust intrusion. UL listed raintight.
  - f. Rated to operate in temperatures from -40 degrees F to 130 degrees F.
  - g. Provide each sensor with manufacturer supplied wire-guard.
  - h. Provide isolated relay for monitoring by security system
  - i. Coverage:
    - 1) Narrow beam up to 100 foot distance.
    - 2) 90 degree beam up to 50 foot distance.
  - j. Finish: White.

- k. Basis of Design: Wattstopper EN Series.
- l. Parking Lot Lighting Control:
  - 1) On/off control based on daylight levels via adjustable light level setting.
  - 2) Low Voltage Sensor: 24VDC power. Sensor operates luminaire high/low control.
  - 3) Adjustable time delay from 15 seconds to 15 minutes.
  - 4) Silicon gasketed to prevent water and dust intrusion. UL listed raintight.
  - 5) Rated to operate in temperatures from -40 degrees F to 130 degrees F.
  - 6) Sensor front rotates and pivots for coverage adjustment after installation.
  - 7) Basis of Design: Wattstopper EW Series
- B. Ultrasonic Occupancy/Vacancy Sensors:
  - 1. Sensor Function: Detects human presence in controlled floor area by detecting Doppler shifts in 40kHz ultrasound created by sensor.
  - 2. Sensors are precision crystal controlled and do not interfere with each other when two or more are placed in same area. Sensor includes advanced digital signal processing to reduce false on signals without decreasing sensitivity, as well as immunity to RFI/EMI sources.
  - 3. Sensor utilizes DIP switches for adjustment to time delay and override. Field adjustable settings for sensitivity.
  - 4. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - 5. Provide adjustments and mounting hardware under removable cover to prevent tampering.
  - 6. Ceiling-Mounted Sensor:
    - a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
    - b. Maximum protrusion of 1.1-inches and blend in aesthetically with ceiling.
    - c. Coverage: 360 degree sensor range; coverage: 2,000 SF, unless otherwise noted on Drawings.
    - d. Provide internal form C dry contacts for HVAC control.
    - e. Basis of Design: Wattstopper WT Series.

7. Ceiling Mounted Sensor - Hallway Sensor Coverage:

- a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
- b. Maximum protrusion of 1.5-inches and blend in aesthetically with ceiling.
- c. Coverage: 90 lineal feet.
- d. Provide internal form C dry contacts for HVAC control.
- e. Basis of Design: Wattstopper UT-300-3 Series.

C. Dual Technology Sensors:

- 1. Sensor Function: Combined capability of passive infrared with ultrasonic or microphonic technology as described above.
- 2. Function: Upon a person entering a space, motion must be sensed by both technologies before lighting will be turned on. After this has occurred, detection by either technology will hold lighting on. Sensors retrigger time delay where only one motion is necessary to turn on lights within 5 seconds after turning off.
- 3. Wall-Mounted Sensor:
  - a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
  - b. 90 degree sensor range with dense wide angle lens, coverage; 1000 SF for desktop motion, unless noted on drawings.
  - c. Swivel mounting bracket for corner mounting to wall or ceiling.
  - d. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - e. Provide internal form C dry contacts for HVAC control.
  - f. Basis of Design: Wattstopper DT Series.
- 4. Ceiling-Mounted Sensor:
  - a. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
  - b. 360 degree sensor range; coverage: 1000 SF for half-step motion, unless otherwise noted on Drawings.
  - c. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.

- d. Provide internal form C dry contacts for HVAC control.
- e. Basis of Design: Wattstopper DT-300 Series.

2.4 COMBINED OCCUPANCY/VACANCY SENSOR/WALL SWITCHES  
("SENSOR/SWITCHES")

- A. Completely self-contained sensor system that fits into standard single gang box. Internal transformer power supply, latching dry contact relay switching mechanism compatible with electronic ballasts, compact fluorescent, and inductive loads. Triac and other harmonic generating devices are not allowed.
- B. Passive infrared sensor technology includes advanced signal processing to reduce false triggers without increasing sensitivity. LED indicator blinks when occupant sensed.
- C. Rated to switch loads: 800 watts incandescent or 120-volt ballast; 1000 watts 277 volt ballast. Zero-crossing technology switches lighting off when AC voltage is at zero, minimizes contact wear.
- D. Provide adjustable daylight feature that holds lighting "off" when desired footcandle level is present.
- E. Provide integral off override switch with no leakage current to load or ground.
- F. Vandal-resistant lens.
- G. Includes neutral wire to meet the latest version of NEC Code.
- H. Finish: White.
- I. Alerts for impending shut-off: light flash, audible, both or none.
- J. Standard Sensor/Switch:
  - 1. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off). Factory set to manual on/auto off.
  - 2. 180 degree sensor range; coverage: 150 SF for desktop activity.
  - 3. Basis of Design: Wattstopper PW-101 Series.
- K. Dual Relay Sensor/Switch:
  - 1. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
  - 2. Dual auto-off buttons on face of switch allow end-user to turn off two switch legs in room space. Built-in light adjustable level sensor only turns off second of two relays when desired footcandle level is present. Otherwise similar to specifications above for single-zone sensor/switch.

3. Defaults to Manual-ON to 50% operation for maximum energy savings.
4. 180 degree sensor range; coverage: 150 SF for desktop activity.
5. Finish: White.
6. Basis of Design: Wattstopper PW-302.

L. Sensor/Slide Dimmer:

1. Line voltage slider dimmer allows for manual adjustment of lighting levels from 100 percent to 10 percent; compatible with two-wire line voltage 100 percent to 10 percent electronic dimming ballasts. Separate manual button for override 'off' control.
2. 180 degree sensor range; coverage: 300 SF for desktop activity.
3. Basis of Design: Wattstopper PW-100D/101D Series.

M. Passive Infrared Wall Switch Vacancy-Only Sensors:

1. Operates only as a vacancy sensor (manual-on and automatic-off) in accordance with California Title 24 requirements.
2. Adjustable sensitivity (high, low presets).
3. Basis of Design: Lutron Maestro MS Series.

N. Dual Technology Wall Switch Vacancy-Only Sensors:

1. Operates only as a vacancy sensor (manual-on and automatic-off) in accordance with California Title 24 requirements.
2. Adjustable sensitivity (high, medium, low, and off presets) individually for passive infrared and ultrasonic sensing.
3. Basis of Design: Lutron Maestro MS Series.

O. Passive Infrared Wall Dimmer Vacancy-Only Sensors:

1. Operates only as a vacancy sensor (manual-on and automatic-off) in accordance with California Title 24 requirements.
2. If more than one model is required, the optional choice can be used to assign type designations. Make sure that designations indicated on the drawings are consistent with those specified here.
3. Basis of Design: Lutron Maestro MSCL Series.

P. Passive Infrared 0-10 V Wall Dimmer Vacancy-Only Sensors:

1. Operates only as a vacancy sensor (manual-on and automatic-off) in accordance with California Title 24 requirements.
2. If more than one model is required, the optional choice can be used to assign type designations. Make sure that designations indicated on the drawings are consistent with those specified here.
3. Basis of Design: Lutron Maestro 0-10V Dimmer Sensor MS Series.

## 2.5 AUTOMATIC SWITCHES

### A. Automatic ("Sentry") Switch:

1. Programmable to operate as an occupancy sensor (automatic-on and automatic-off) or a vacancy sensor (manual-on and automatic-off).
2. Controls up to 1800 watts at 120-volt, 4100-watts at 277-volt, suitable for ballast and motor loads.
3. Compatible with Decora style faceplate.
4. Zero crossing circuitry.
5. Finish: Match wiring devices unless selected otherwise by Architect.
6. Capable of being connected with other sentry switches to produce 3 and 4 way switching.
7. Based on power interruptions of following durations from an upstream control panel, produces following effects:
  - a. 5 Seconds: Turns lighting off with no delay.
  - b. 3 Seconds: Turns lighting on with no delay.
  - c. 1 to 2 Seconds: Delayed off. Blinks lights and provides audible signal to room occupant. If switch push button is not pressed within 5 minutes, lights are turned off.
8. Basis of Design: Wattstopper AS-100 Series.

### B. Digital Timer Switch:

1. Controls up to 1800 watts at 120 volt, 4100 watts at 277 volt, suitable for ballast and motor loads.
2. Compatible with Decora style faceplate.
3. Provide low voltage (24VAC/VDC) version where used as input to lighting relay panel; includes single-pole, double-throw isolated relay rated for 1A at 30VDC.
4. Electroluminescent LCD display shows timer countdown.

5. Time out setting range from 5 minutes to 12 hours. Lights can be turned off before time-out setting by holding down on/off button.
6. Timer countdown can be reset to beginning by holding down push button for 2 seconds.
7. Zero crossing circuitry.
8. Finish: White.
9. Room lighting flashed and switch beeps 5 minutes and 1 minute prior to switching room lighting off. Either visible or audible features can be disabled.
10. Basis of Design: Wattstopper TS-400 Series.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install occupancy/vacancy sensors as directed by manufacturer's instructions. Complete connections to control circuits, occupancy sensors, power supply pack and low voltage wiring.
- B. Provide power packs for sensor to control number of circuits and/or switch legs within its area of coverage.
- C. Field adjust each sensor to maximize its coverage of room space.
- D. Relocate sensors with ultrasonic technology to avoid being closer to HVAC diffusers and power packs than recommended by manufacturer.
- E. Field set time delay for each device as noted below:
  1. Classrooms and Conference Rooms: 30 minutes.
  2. Restrooms: 15 minutes.
  3. Storage Rooms, Janitor's Closets, Unisex Restrooms: 5 minutes.
  4. All Other Spaces: 15 minutes.
  5. Time Switches: 2-hours.
- F. Prior to applying dimming controls, maintain fluorescent lighting at full output for minimum of 100 hours. If this is not done, replace lamps and ballasts of affected luminaires at no cost to Owner.
- G. Coordinate HVAC control requirements with controls contractor prior to installation.
- H. Lighting System Testing and Commissioning:

1. Test lighting controls to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with Drawings and Specifications. Provide functional testing of sequences of operation to ensure operation in accordance with Drawings and Specifications. Provide complete report of test procedures and results to engineer and insert approved copy into project closeout documents.
2. Testing includes:
  - a. Daylight Automatic Controls
  - b. Occupant Sensing Automatic Controls
  - c. Automatic Time and Override Controls for Interior Lighting
  - d. Automatic Time and Photo Controls for Exterior Lighting

**END OF SECTION**



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**SECTION 26 22 00**

**LOW-VOLTAGE TRANSFORMERS**

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**PART 1 - GENERAL**

1.1 SUMMARY

A. Work Included:

1. Two-Winding Transformers

1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical apply to this Section.

1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, meet the following:
1. UL 1561: Dry-Type General Purpose and Power Transformers.

1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.

1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.
- B. In addition, meet the following:
1. Production test each unit according to NEMA Standard 20.

1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

- A. Eaton
- B. General Electric
- C. Siemens

- D. Schneider Electric/Square D
- E. Or approved equivalent.
- F. Basis of Design: General Electric. Manufacturers listed are allowed on condition of meeting specified conditions including available space for equipment and Code required working clearances. Remove and replace equipment installed that does not meet these conditions at no cost to Owner.

## 2.2 TWO-WINDING TRANSFORMERS

- A. Description: Factory assembled, air cooled dry type transformer. Efficiency compliant with Federal Code 10 CFR Part 431 and DOE 2016 efficiency requirements. NEMA TP-1 efficiency levels are not acceptable.
- B. Primary Voltage: 480 volts, 3 phase.
- C. Secondary Voltage: 208Y/120 volts, 3 phase.
- D. Windings: Copper.
- E. Insulation system and average winding temperature rise for rated kVA as follows:
  - 1. 1-15 kVA: Class 220 with 115 degrees C rise.
  - 2. 16-500 kVA: Class 220 with 115 degrees C rise.
- F. Maximum Winding Temperature: Do not exceed 30 degrees C rise above 40 degrees C ambient at warmest point at full load.
- G. Winding Taps:
  - 1. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
  - 2. Transformers 15 kVA and Larger: NEMA ST 20.
- H. Conductor Termination Lugs: Compression.
- I. Sound Levels: NEMA ST 20.
- J. Basic Impulse Level: 10 kV.
- K. Impedance: 3 to 5 percent, unless otherwise noted on drawings. Minimum reactance 2 percent.
- L. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- M. Mounting:
  - 1. 1-15 kVA: Suitable for wall, floor, or trapeze mounting.

- 2. 16-75 kVA: Suitable for wall, floor, or trapeze mounting.
- 3. Larger than 75 kVA: Suitable for floor mounting.
- N. Coil Conductors: Continuous windings with terminations brazed or welded.
- O. Transformer Enclosure: NEMA ST 20.
  - 1. Interior: Type 1.
  - 2. Exterior: Type 3R.
  - 3. Ventilated.
  - 4. Provide lifting eyes or brackets.
- P. Isolate core and coil from enclosure using vibration-absorbing mounting pads.
- Q. Nameplate: Reference Section 26 05 53, Identification for Electrical Systems.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Set transformers plumb and level.
- B. Use flexible conduit, 2-feet minimum length with slack, for connections to transformer case. Make conduit connections to side panel of enclosure.
- C. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by manufacturer. Mount to allow a minimum of 6-feet, 6-inches headroom below unit.
- D. Provide seismic restraints.
- E. Provide grounding and bonding in accordance with Section 26 05 26, Grounding and Bonding of Electrical Systems.
- F. Clearance: Minimum 6-inches clear on sides and back. Front clearance per NEC 110.26. Maintain minimum clearance from combustible materials per NEC. Comply with manufacturers recommendations.
- G. Exterior Installations: Weather resistant enclosure.
  - 1. Provide 8-inches diameter by 24-inches (above and below grade) concrete filled steel bollards where subject to vehicular traffic.
  - 2. Where grouped with switchgear refinish as required so that transformers and switchgear match in color.
- H. Unacceptable Humming and Noise Levels: Revise installation as required to achieve a noise level less than or equal to those defined in NEMA ST-20 for associated transformer size or replace with a new unit with an acceptable sound level.

- I. Provide equipment nameplates per Section 26 05 53, Identification for Electrical Systems.
- J. Provide arc flash labels .

### 3.2 FIELD QUALITY CONTROL

- A. Perform field inspection, testing, and adjusting.
- B. Perform inspections and tests listed in accordance with manufacturers requirements. In addition including following:
  - 1. Perform turns ratio tests at tap positions.
  - 2. Verification that as-left tap connections are as specified.
  - 3. Perform excitation-current tests on each phase.
  - 4. Measure resistance of each winding at each tap connection.
  - 5. Overpotential test on high- and low-voltage windings-to-ground.
- C. Check for damage and tight connections prior to energizing transformers.

### 3.3 ADJUSTING

- A. Measure primary and secondary voltages and make appropriate tap adjustments.

**END OF SECTION**

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**SECTION 26 24 16**

**PANELBOARDS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included:

1. Panelboards

**1.2 RELATED SECTIONS**

A. Contents of Division 26, Electrical apply to this Section.

B. In addition, reference the following:

**1.3 REFERENCES AND STANDARDS**

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

B. In addition, meet the following:

1. UL 67, Standards for Panelboards.

**1.4 SUBMITTALS**

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.

**1.5 QUALITY ASSURANCE**

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.

**1.6 WARRANTY**

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

A. Panelboards:

1. Eaton
2. General Electric
3. Siemens

4. Schneider Electric/Square D
  5. Or approved equivalent.
- B. Manufacturers listed above are allowed on condition of meeting specified conditions including available space for equipment, Code required working clearances . Prior to submitting bid, manufacturer to provide documentation to Engineer verifying specific conditions, including those mentioned above, can be met. Remove and replace electrical equipment installed, at no cost to the Owner, that does not meet these conditions.
- C. Basis of Design: Schneider Electric/Square D. Manufacturers listed are allowed on condition of meeting specified conditions including available space for the equipment and Code required working clearances . Remove and replace electrical equipment installed that does not meet these conditions at no cost to Owner.

## 2.2 PANELBOARDS

- A. Description: Panelboards 400 amps or less. NEMA PB1, Type 1 as indicated on drawings, circuit breaker type. Maximum enclosure depth: 6-inches for surface mounted, 5 3/4-inches for flush mounted.
- B. Maximum Width: 20-inches.
- C. Integrated Equipment Rating: Provide fully rated integrated equipment rating greater than the available fault current. Series rated panelboards are not acceptable. Reference drawings for available fault current.
- D. Panelboard Bus Non-Reduced: Copper, ratings as indicated on drawings. Bus bar with suitable electroplating (tin) for corrosion control at connection. Provide copper ground bus in each panelboard .
- E. Lugs: Mechanical type for copper conductors.
- F. Provide double lugs and/or feed-through lugs for feed through feeders.
- G. Molded Case Circuit Breakers: Thermal magnetic trip circuit breakers, bolt-on type, with common trip handle for poles; UL listed. Predrill bus for bolt-on breakers.
1. Class B ground fault equipment protection circuit breakers for heat trace and other circuits as required by Code. Provide shunt trip circuit breakers where scheduled; provide wiring to remote trip switch/contacts as indicated on Drawings.
  2. Do not use tandem circuit breakers.
- H. Accessories: Provide where indicated: shunt trip, arc-fault circuit interrupter (AFCI), Class A ground fault circuit interrupter (GFCI), auxiliary switch and alarm switch.
- I. Cabinet Front: Provide flush or surface mounting as shown on the schedules, drawings, or otherwise noted. Cabinet front with concealed hinged front cover door-in-door construction, metal directory frame with heavy clear plastic protector, flush lift latch and lock, two keys per panel all keyed alike.

- J. Provide boxes with removable blank end walls and interior mounting studs. Provide interior support bracket for ease of interior installation.
- K. Furnish surface mounted cabinet boxes without knockouts.
  - 1. Minimum Integrated Short Circuit Rating:
    - a. 10,000 amperes symmetrical for 240 V panelboards.
    - b. Minimum rating as indicated on the Drawings or Panel Schedules.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install panelboards in accordance with NEMA PB 1.1, NECA 1 and manufacturers installation instructions.
- B. Install panelboards level and plumb. Install recessed panelboards flush with wall finishes.
- C. Height: 6-feet 6-inches to top of panelboard; install panelboards taller than 6-feet 6-inches with bottom no more than 4-inches (100 mm) above floor.
- D. Provide filler plates for unused spaces in panelboards.
- E. Provide typed circuit directory for each branch circuit panelboard. Include all "spaces" and "spares." Revise directory to reflect circuiting changes and as-installed conditions. Use final Owner designated room names and numbers, and not designations shown on drawings.
- F. Provide engraved plastic nameplates per Section 26 05 53, Identification for Electrical Systems.
- G. Provide arc flash labels .
- H. Provide permanent identification number in or on panelboard dead-front adjacent to each breaker pole position. Horizontal centerline of numbers to correspond with centerline of circuit breaker pole position.
- I. Ground and bond panelboard enclosure per NEC.
- J. Paint:
  - 1. Standard factory finish unless noted otherwise.
  - 2. Panelboards located in finished interior areas in view of building occupants; paint to match adjacent wall surface. Color and paint preparation as specified by Engineer. Covers to be painted off wall, then installed over dried, painted wall surface.
- K. Provide interior wiring diagram, neutral wiring diagram, UL label, and short circuit rating on interior or in booklet format inserted in sleeve inside panel cover.

- L. Verify available recessing depth and coordinate wall framing with other divisions.
- M. Maintain fire rating of wall where panels are installed flush in fire rated walls.
- N. Perform inspections and tests in accordance with manufacturer's requirements.
- O. Thoroughly clean exterior and interior of each panelboard in accordance with manufacturer's installation instructions.
- P. Vacuum construction dust, dirt, and debris out of each panelboard.
- Q. Where enclosure finish is damaged, touch up finish with matching paint in accordance with manufacturer's specifications and installation instructions.

### 3.2 PANELBOARDS INSTALLATION

- A. Breakers being added to existing panelboards: Coordinate breaker type and short circuit rating with existing panelboard. Breakers to match existing in manufacturer's type and AIC rating. Provide new typed circuit directory.
- B. Provide handle tie to branch circuit breakers of multiwire branch circuits for simultaneous disconnection of circuits. Handle tie will be identified for use with circuit breakers provided. Reconfigure assigned circuits as necessary so that circuit breakers associate with multiwire branch circuits are physically adjacent, record changes in panelboard schedules and circuiting plans for record drawings.
- C. Shunt Trip Circuit Breakers: Provide wiring to remote trip switch/contacts as indicated on Drawings.
- D. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

**END OF SECTION**



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**SECTION 26 27 26**

**WIRING DEVICES**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Work Included: Provision of materials, installation and testing of:

1. Wall Switches
2. Receptacles
3. Finish Plates
4. Wall Dimmers
5. Surface Covers

**1.2 RELATED SECTIONS**

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

**1.4 SUBMITTALS**

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:

1. Wall switches and Dimmers
2. Receptacles
3. Wall Plates
4. In-Use Cover

**1.5 QUALITY ASSURANCE**

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

## 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

#### A. Wall Switches:

- 1. Toggle Type Characteristics:
  - a. Cooper AH1201
  - b. Hubbell HBL1221
  - c. Leviton 1221
  - d. Legrand P&S PS20AC1
  - e. Or approved equivalent.

#### B. Receptacles:

- 1. Commercial Grade:
  - a. 20 Amp:
    - 1) Cooper 5362
    - 2) Hubbell 5362
    - 3) Bryant CBRS20
    - 4) Leviton 5362S
    - 5) Legrand P&S 5362
    - 6) Or approved equivalent.
- 2. Ground Fault Circuit Interrupter (GFCI) Receptacle:
  - a. Cooper TWRSGF20
  - b. Hubbell GFTWRST20
  - c. Legrand P&S 2097TRWR
  - d. Or approved equivalent.

#### C. Finish Plates:

- 1. Bryant

2. Cooper
3. Hubbell
4. Leviton
5. Legrand P&S
6. Or approved equivalent.

D. Wall Dimmers:

1. Lutron Maestro Series
2. Or approved equivalent.

E. Surface Covers:

1. Aluminum with Gasket, Blanks, Single Gang:
  - a. Bell 240-ALF
  - b. Carlon
  - c. Or approved equivalent.
2. 2-Gang:
  - a. Bell 236-ALF
  - b. Carlon
  - c. Or approved equivalent.
3. While-in-Use Weatherproof Cover:

F. Provide lighting switches and receptacles of common manufacturer and appearance.

2.2 WALL SWITCHES

- A. Characteristics: Toggle type, quiet acting, 20 amp, 120/277 volt, UL listed for motor loads up to 80 percent of rated amperage, extra heavy duty.
- B. Finish: Match Building Standard.

2.3 RECEPTACLES

- A. Duplex Receptacles Characteristics: Straight parallel blade, 125 volt, 2 pole, 3 wire grounding.
  1. Commercial Grade: Riveted. Back and side wired. Brass ground contact on steel strap. Nylon face and nylon base. 20 amp.

- B. Ground Fault Circuit Interrupter (GFCI) Receptacle: Feed through type, back-and-side wired, tamper-resistant, weather resistant self-testing, 20 amp, 125VAC.
- C. Special Purpose Receptacles: Reference Drawings for NEMA Standard Specification.
- D. Finish:
  - 1. Same exposed finish as switches.
  - 2. Receptacles installed in surface raceway to match raceway finish. See Section 26 05 33, Raceways.

## 2.4 FINISH PLATES

- A. Finish Plates: Match building standard
- B. Provide telephone/signal device plates; activated outlets to have coverplates to match modular jack.

## 2.5 WALL DIMMERS

- A. Provide wall dimmers compatible with type of load controlled (i.e. line voltage, low voltage, 2-wire, 3-wire, 0-10v). Finish to match wall switches. Size dimmers to accept connected load. Do not cut fins. Where dimmers are ganged together, provide a single multi gang coverplate.
- B. LED indicator dots show by what percentage controlled lighting is dimmed. Programmable settings for maximum and minimum trim settings, and rate of change in lighting levels.

## 2.6 SURFACE COVERS

- A. Material: Galvanized steel, 1/2-inch raised industrial type with openings appropriate for devices installed on surface receptacles.
- B. Cast Box and Extension Adaptors: Aluminum with gasket, blanks single gang.
- C. While-in-Use Weatherproof Cover: NEMA 3R when closed over energized plug. Vertical mount for duplex receptacle. Provide continuous use cover with cover capable of closing over energized cord cap with bottom aperture for cord exit.

# PART 3 - EXECUTION

## 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. See Architectural elevations for location and mounting height of wiring devices. Review Architectural elevations prior to rough-in and contact Architect immediately if conflicts are found between Architectural and Electrical Drawings. Do not rough-in devices until conflicts are resolved.
- B. Install wiring devices and finish plates plumb with building lines, equipment cabinets and adjacent devices. Devices not plumb will be fixed at no additional cost to Owner.

C. Orientation:

1. Install wiring devices with long dimension oriented vertically at centerline height shown on drawings or as specified.
2. Vertical Alignment: When more than one device is shown on drawings in close proximity to each other, but at different elevations, align devices on a common vertical center line for best appearance. Verify with Architect.
3. Horizontal Alignment: When more than one device is shown on drawings in close proximity to each other with same elevation, align devices on a common horizontal center line for best appearance. Verify with Architect.

D. Provide labeling per Section 26 05 53, Identification for Electrical Systems.

E. Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements. Test receptacles for line to neutral, line to ground and neutral to ground faults. Correct any defective wiring.

### 3.2 WALL SWITCHES INSTALLATION

- A. At time of substantial completion, replace those items which have been damaged.

### 3.3 RECEPTACLES INSTALLATION

- A. Upon installation, adhere to proper and cautious use of convenience receptacles. At time of substantial completion, replace those items which have been damaged, including those burned and scored by faulty receptacles or cord caps.
- B. GFCI Receptacles: One GFCI receptacle may not be used to provide GFCI protection to downstream duplex receptacles on the same branch circuit.
- C. Provide a split wired receptacle or one controlled receptacle within 6 feet of each uncontrolled receptacle for the following areas: Offices, reception lobbies, conference rooms, and copy rooms .

### 3.4 FINISH PLATES INSTALLATION

- A. Do not install items until finish painting is complete. Replace scratched and paint splattered finish plates and wiring devices.

### 3.5 WALL DIMMERS INSTALLATION

- A. Install per manufacturer's recommendations and wiring diagrams.

### 3.6 SURFACE COVERS INSTALLATION

- A. Do not install items until finish painting is complete. Replace scratched and paint splattered finish plates and wiring devices.

## END OF SECTION



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**SECTION 26 28 16**

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**ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Manual Motor Starters
  - 2. Safety Switches

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
  - 1. Section 26 24 16, Panelboards.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements.

**1.5 QUALITY ASSURANCE**

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements.

**1.6 WARRANTY**

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manual Motor Starters:
  - 1. Eaton Electrical
  - 2. General Electric

3. Siemens
4. Schneider Electric/Square D
5. Or approved equivalent.

B. Safety Switches:

1. Eaton Electrical
2. GE Industrial
3. Siemens
4. Schneider Electric/Square D
5. Or approved equivalent.

2.2 MANUAL MOTOR STARTERS

- A. Quick-Make, Quick-Break. Thermal overload protection. Device labeled with maximum voltage, current, and horsepower.
- B. Enclosure:
  1. NEMA 1: Dry locations/Indoors.
  2. NEMA 3R: Damp or wet locations/Outdoors.

2.3 SAFETY SWITCHES

- A. Heavy duty fusible type and non-fusible type (as indicated on drawings), dual rated, quick-make, quick-break with fuse rejection feature for use with Class R fuses only, unless other fuse type is specifically noted.
- B. Clearly marked for maximum voltage, current, and horsepower.
- C. Operable handle interlocked to prevent opening front cover with switch in 'on' position.
- D. Switches rated for maximum available fault current.
- E. Handle lockable in 'off' position.
- F. Enclosure:
  1. NEMA 1: Dry locations/Indoors.
  2. NEMA 3R: Damp or wet locations/Outdoors.



## **PART 3 - EXECUTION**

### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Obtain and review the submitted product data for equipment furnished by the Owner, and furnished under other Divisions of this contract.
- B. Confirm the equipment nameplate maximum overcurrent protection (MOCP) and make accommodations and adjustments to switches, fuses and circuit breakers as necessary to coordinate with the nameplate rating
- C. Install in accordance with manufacturer's instructions.
- D. Provide engraved nameplates per Section 26 05 53, Identification for Electrical Systems.
- E. Provide arc flash labels.
- F. Apply neatly typed adhesive tag on inside door of each fusible switch indicating NEMA fuse class and size installed.

### **3.2 DISCONNECT SWITCHES**

- A. Install fuses in fusible disconnect switches. Coordinate fuse ampere rating with installed equipment. Do not provide fuses of lower ampere rating than motor starter thermal units.
- B. Install products, systems and equipments in accordance with manufacturers written instructions and requirements.
- C. See General Installation Requirements above.

### **3.3 MANUAL MOTOR STARTERS**

- A. Provide disconnecting means within sight of each motor controller and of each motor. Motor controller disconnecting means equipped with lock-out/tag-out padlock provisions do not require a disconnect switch at the controlled motor location. Locate disconnect means in view of and not inside of equipment, such that tools are not needed to remove covers to access the disconnecting means.
- B. Install products, systems and equipments in accordance with manufacturers written instructions and requirements.
- C. See General Installation Requirements above.

### **3.4 SAFETY SWITCHES**

- A. Install products, systems and equipments in accordance with manufacturers written instructions and requirements.

- B. See General Installation Requirements above.

**END OF SECTION**

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**SECTION 26 51 00**

**LIGHTING**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included:
  - 1. Luminaires
  - 2. LED Drivers
  - 3. Lamps
- B. Provide wiring for complete and operating lighting system.

**1.2 RELATED SECTIONS**

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

**1.3 REFERENCES AND STANDARDS**

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. NECA 500 - Commercial Lighting.
  - 2. UL 8750 – Light Emitting Diode (LED) equipment for use in lighting products.

**1.4 SUBMITTALS**

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
  - 1. Submit:
    - a. LED Luminaires: Electrical ratings, dimensions, mounting, material, clearances, terminations, wiring, connection diagram, LM-79 photometric data, LM-80 lumen depreciation data.
    - b. LED Drivers
    - c. Lamps

2. Submittal Cutsheets: Highlight, circle or otherwise graphically indicate which option(s) are being selected for the products submitted. Cutsheets that are not edited to indicate which products and options are submitted for this project or that list only catalog numbers to identify submitted options are not acceptable.
3. Specified manufacturers are approved to submit bid. However, inclusion does not relieve manufacturer from supplying product as described.
4. Provide the following operating and maintenance instructions as required by Section 26 00 00, Electrical Basic Requirements:
  - a. Luminaires
  - b. LED Drivers
  - c. Lamps

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  1. Provide luminaires acceptable to code authority for application and location installed.
  2. Comply with applicable ANSI standards.
  3. Comply with applicable NEMA standards.
  4. Provide luminaires and lampholders that comply with UL standards and have been listed and labeled for location and use indicated by a testing agency acceptable by the AHJ (e.g., UL, ETL, and the like).
  5. Comply with CEC as applicable to installation and construction of luminaires.
  6. Comply with fallout and retention requirements of CBC for diffusers, baffles, and louvers.
  7. Provide LED luminaires from the same manufacturer and manufacturing LED source batch for similar applications (e.g., all LED downlights from a single manufacturer and batch, all linear LED products from single manufacturer and batch).

#### 1.6 WARRANTY

- A. Warranty as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:

1. LED Luminaire Manufacturer's Warranty: Not less than 5 years for luminaire based on date of substantial completion. Includes normal cost of labor to replace luminaire. Replacement luminaire will match physical dimensions, physical appearance, chromaticity, lumen output and photometric characteristics of original installed equipment.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

#### **A. Luminaires:**

1. Reference description and manufacturers in Luminaire Schedule on Drawings.
2. Or approved equivalent.

#### **B. LED Drivers:**

1. Indoor Drivers:
  - a. eldoLED Series
  - b. Advance/Philips
  - c. Osram Sylvania
  - d. Or approved equivalent.

#### **C. Lamps:**

1. LED (Light Emitting Diode) Lamps:
  - a. Nichia
  - b. Cree
  - c. Osram Sylvania
  - d. GE Lumination
  - e. Or approved equivalent.
2. Unless specific manufacturer not shown on this list is indicated in the Luminaire Schedule.
3. Special types as indicated in Luminaire Schedule.
4. Or approved equivalent.

### **2.2 LUMINAIRES**

- #### **A. Luminaires:**
- Reference description and manufacturers in Luminaire Schedule on drawings.

- B. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.
- C. UL label luminaires installed under canopies, roof or open porches, and similar damp or wet locations, as suitable for damp or wet location.
- D. Suspended luminaires: Provide minimum 24-inch adjustability in aircraft cable length where used.
- E. Recessed Luminaires: Frame compatible with ceiling material installed at particular luminaire location. Provide proper factory trim and frame for luminaire to fit location and ceiling material. Verify with Architectural Reflected Ceiling Plan prior to submittals.
- F. Finishes:
  - 1. Manufacturer's standard finish (unless otherwise indicated) over corrosion resistant primer.
  - 2. Interior Light Reflecting Finishes: White or specular finish with not less than 85 percent reflectance.
  - 3. Exterior Finishes: As detailed in Luminaire Schedule or on drawings. Refer cases of uncertain applicability to Architect for resolution prior to release for fabrication.
- G. Light Transmitting Components:
  - 1. Plastic diffusers, molded or extruded of 100 percent virgin acrylic.
  - 2. Prismatic acrylic, extruded, flat diffusers, 0.125-inch overall thickness, unless otherwise noted.
- H. LED Luminaires:
  - 1. UL listing of luminaire includes drivers, transformers, enclosures, rated wire, communications devices and accessories needed for a complete and functional system.
  - 2. LM-79: Testing and measurement of absolute photometry, chromaticity (CCT) and luminaire power. Report provided by DOE certified independent testing laboratory. CCT as specified in Luminaire Schedule.
  - 3. Standards: ANSI C78.377, LM-79 and LM-82 compliant for performance characteristics, photometry, colorimetry, efficacy and thermal characteristics.
  - 4. LM-80 + TM-21: Testing and measurement, and statistical prediction of LED lamp life. Report provided by DOE certified independent testing laboratory.
  - 5. LEDs in one module/luminaire: Supplied from same batch/bin and fall within 3-step MacAdam Ellipse, or as described in Luminaire Schedule, whichever is the more stringent requirement.
  - 6. Provide luminaires with integral LED thermal management system (heat sinking).

7. Luminaires to be equipped with an LED driver that accepts 120V through 277V, 50Hz to 60Hz (universal). Component-to-component wiring within the luminaire will carry no more than 80 percent of rated current and be listed by UL for use at 600VAC at 302 degrees F/150 degrees C or higher. Plug disconnects to be listed by UL for use at 600VAC, 15A or higher.
8. Provide luminaires with individual LED arrays/modules and drivers that are accessible and replaceable from exposed side of the luminaire.

## 2.3 LED DRIVERS

### A. General:

1. Performance: Meet dimming range called out in Luminaire Schedule, free from perceived flicker or visible stroboscopic flicker, smooth and continuous change in level (no visible steps in transitions), natural square law response to control input, and stable when input voltage conditions fluctuate over what is typically experienced in a commercial environment. Demonstration of this compliance to dimming performance will be necessary for substitutions or prior approval.
2. Ten-year expected life while operating at maximum case temperature and 90 percent non-condensing relative humidity.
3. Minimum efficiency of 85 percent, power factor greater than or equal to 0.90, compliance with reduction of hazardous substances (RoHS). Rated for operating temperature range of area in which driver is installed.
4. Limit inrush current to minimize breaker tripping.
  - a. Base specification: NEMA 410 standard for inrush current for electronic drivers.
  - b. Preferred Specification: Meet or exceed 30 milliamp-squared-seconds at 277VAC for up to 50 watts of load and 75 amps at 240 microseconds at 277VAC for 100 watts of load.
5. Withstand up to a 1,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
6. No visible change in light output with a variation of plus/minus 10 percent line voltage input.
7. Total Harmonic Distortion less than 20 percent percent and meet ANSI C82.11 maximum allowable THD requirements at full output. THD at no point in the dimming curve allows imbalance current to exceed full output THD.
8. Support automatic adaptation, allowing for future luminaire upgrades and enhancements and deliver improved performance:
  - a. Adjustment of forward LED voltage, supporting 3V through 55V.
  - b. Adjustment of LED current from 150mA to 1.4A at the 100 percent control input point in increments of 1mA.

- c. Adjustment for operating hours to maintain constant lumens (within 5 percent) over the 50,000 hour design life of the system, and deliver up to 20 percent energy savings early in the life cycle.
9. Operate for a (+/- 10 percent) supply voltage of 120V through 277VAC at 60Hz.
10. UL Recognized under the component program and modular for simple field replacement. Drivers that are not UL Recognized or not suited for field replacement will not be considered.
11. Ability to provide no light output when the analog control signal drops below 0.3 V, or the DALI/DMX digital signal calls for light to be extinguished and consume 0.5 watts or less in this standby. Control dead band between 0.3V and 0.65V included to allow for voltage variation of incoming signal without causing noticeable variation in luminaire to luminaire output.

**B. Light Quality:**

1. Over the entire range of available drive currents, driver to provide step-free, continuous dimming to black from 100 percent to 0.1 percent and 0 percent relative light output, or 100 percent to 1 percent light output and step to 0 percent where indicated. Driver to respond similarly when raising from 0 percent to 100 percent.
  - a. Driver must be capable of 20 bit dimming resolution for white light LED drivers or 15 bit resolution for RGBW LED drivers.
2. Driver must be capable of configuring a linear or logarithmic dimming curve, allowing fine grained resolution at low light levels.
3. Drivers to track evenly across multiple luminaires at all light levels, and must have an input signal to output light level that allows smooth adjustment over the entire dimming range.
4. Driver and luminaire electronics to deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100 percent to 0.1 percent luminaire will have:
  - a. LED dimming driver to provide continuous step-free, flicker free dimming similar to incandescent source.
  - b. Base specification: Based on IEEE PAR1789, minimum output frequency should be greater than 1250 Hz.
  - c. Preferred specification: Flicker index to be equal to incandescent, less than 1 percent at all frequencies below 1000 Hz.

**C. Control Input:**

1. Provide control protocol to match lighting control system specified for use with luminaire.



2. 4-Wire (0-10V DC Voltage Controlled) Dimming Drivers:

- a. Meet IEC 60929 Annex E for General White Lighting LED drivers.
- b. Connect to devices compatible with 0 to 10V Analog Control Protocol, Class 2, capable of sinking 0.6 ma per driver at a low end of 0.3V. Limit the number of drivers on each 0-10V control output based on voltage drop and control capacity.
- c. Meet ESTA E1.3 for RGBW LED drivers.

2.4 LAMPS

- A. Provide lamps for luminaires.
- B. Provide lamp catalogued for specified luminaire type.
- C. LED (Light Emitting Diode):
  - 1. LED manufacturer will include, but not be limited to, light source, luminaire, power supply and control interface with added components as needed for complete and functioning system.
    - a. Comply with ANSI chromaticity standard for classifications of color temperature. See Luminaire Schedule for specified LED lamp color and color temperature. UL or ETL listed and labeled.
    - b. Luminaire testing per IESNA LM-79 and LM-80 procedures.
    - c. Lamp life for white LEDs: 50,000 plus hours with lamp failure occurring when LED produces 70 percent of initial rated lumens.
    - d. Lamp life for color LEDs: 30,000 plus hours with lamp failure occurring when LED produces 50 percent of its initial rated lumens.
    - e. LED Drivers: Reverse polarity protection, open circuit protection, require no minimum load. Minimum 80 percent efficiency. Class A noise rating.
    - f. Dimming: LED system capable of full and continuous dimming.
    - g. Correlated Color Temperature (CCT): See Luminaire Schedule for selection of color temperature for each luminaire. Ranges given below reflect maximum allowable tolerances for color temperature range for each nominal CCT.
      - 1) Nominal CCT:
        - a) 2700 K (2725 ± 145)
        - b) 3000 K (3045 ± 175)
        - c) 3500 K (3465 ± 245)

- d) 4000 K (3985 ± 275)
- h. Color Rendering Index (CRI) to be greater than or equal to 80.
- 2. Special types as indicated in Luminaire Schedule.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL INSTALLATION REQUIREMENTS**

- A. Install per manufacturer's written installation instructions and requirements.
- B. Install luminaires securely, in neat and workmanlike manner.
- C. Install luminaires of types indicated where shown and at indicated heights in accordance with manufacturer's written instructions and with recognized industry practices to ensure that luminaires comply with requirements and serve intended purposes.
- D. Wiring:
  - 1. Recessed luminaires to be installed using flexible metallic conduit with luminaire conductors spliced to branch circuit conductors in nearby accessible junction box over ceiling. Junction box fastened to building structural member within 6-feet of luminaire.
  - 2. Luminaires for lift out and removal from ceiling pattern without disconnecting conductors or defacing ceiling materials.
  - 3. Flexible connections where permitted to exposed luminaires; neat and straight, without excess slack, attached to support device.
  - 4. Install junction box, flexible conduit and high temperature insulated conductors for through wiring of recessed luminaires.
- E. Relamp luminaires which have failed lamps at substantial completion.
- F. Replace LED drivers deemed as excessively noisy by Architect, Engineer, or Owner.
- G. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
- H. Support luminaires larger than 2- by 4-foot size independent of ceiling framing.
- I. Locate recessed ceiling luminaires as indicated on architectural reflected ceiling plan.
- J. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- K. Exposed Grid Ceilings:
  - 1. Support surface mounted luminaires in grid ceiling directly from building structure.

2. Provide auxiliary members spanning ceiling grid members to support surface mounted luminaires.
  3. Fasten surface mounted luminaires to ceiling grid members using bolts, screws, rivets, or suitable clips.
- L. Install recessed luminaires to permit removal from below.
- M. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- N. Install clips to secure recessed grid-supported luminaires in place.
- O. Install wall mounted luminaires, emergency lighting units, and exit signs at height as indicated on Architectural Drawings.
- P. Install accessories furnished with each luminaire.
- Q. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- R. Bond products and metal accessories to branch circuit equipment grounding conductor.
- S. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.
- T. Where manufactured wiring assemblies are used, ensure that wiring assembly manufacturer sends components to appropriate luminaire manufacturer for respective installation of proper components.
- U. Coordination:
1. Coordination of Conditions: Coordinate ceiling construction, recessing depth and other construction details prior to ordering luminaires for shipment. Refer cases of uncertain applicability to Architect for resolution prior to release of luminaires for shipment. Where luminaires supplied do not match ceiling construction, replace luminaires at no cost to Owner.
  2. Electrical drawings are schematic, identifying quantity and type of luminaires used and their approximate location, but are not to be used for dimensional purposes. Reference architectural drawings for exact locations, including mounting heights.
  3. Provide lighting indicated on drawings with luminaire of the type designated and appropriate for location.
  4. Provide LED luminaires with driver compatible to lighting control system as shown in drawings and as specified.
  5. Where remote drivers are required, ensure adequate accessibility to driver. Upsize conductors between luminaire and driver to accommodate voltage drop.
- V. Field Quality Control:

1. Perform field inspection in accordance with Division 01, General Requirements.
2. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

W. Cleaning:

1. Clean electrical parts to remove conductive and deleterious materials.
2. Remove dirt and debris from enclosures.
3. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.
4. Clean photometric control surfaces as recommended by manufacturer.
5. Clean finishes and touch up damaged finishes per by manufacturer's instructions.

X. Demonstrate luminaire operation for minimum of two hours.

### 3.2 LUMINAIRES

- A. Install per manufacturer's written installation instructions and requirements.
- B. Align, mount and level luminaires uniformly. Use ball hangers for suspended stem mounted luminaires.
- C. Avoid interference with and provide clearance from equipment. Where indicated locations for luminaires conflict with locations for equipment, change locations for luminaire by minimum distance necessary as directed by Architect.
- D. Suspended Luminaires: Mounting heights indicate clearances between bottom of luminaire and finished floors.
- E. Interior Luminaire Supports:
  1. Support Luminaires: Anchor supports to structural slab or to structural members within a partition, or above a suspended ceiling.
  2. Maintain luminaire positions after cleaning and relamping.
  3. Support luminaires without causing ceiling or partition to deflect.
  4. Provide mounting supports for recessed and pendant mounted luminaires as required by CBC.
- F. Adjusting:
  1. Aim and adjust luminaires as indicated.
  2. Focus and adjust floodlights, spotlights and other adjustable luminaires, with Architect, at such time of day or night as required.
  3. Align luminaires that are not straight and parallel/perpendicular to structure.

4. Position exit sign directional arrows as indicated.

G. Demonstrate luminaire operation for minimum of two hours.

### 3.3 LED DRIVERS

A. Install lamps per manufacturer's installation instructions and requirements.

B. Where driver is remote mounted, size wiring based on type of driver, driver distance from luminaire, and voltage/power level, and manufacturer's installation instructions.

C. Protect 0-10V input from line voltage mis-connection, and so it will be immune and the output unresponsive to induced AC voltage on the control leads.

**END OF SECTION**