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Marin Center Exhibit Hall Seismic Retrofit

PROJECT NO. CAP 19-1101

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PROJECT AUTHORIZATION

MARIN CENTER EXHIBIT HALL
SEISMIC RETROFIT

COUNTY PROJECT NO. CAP 19-1101

Rosemarie R. Gaglione
Director of Department of Public Works

Eric K. Lueder
Interim Deputy Director

Dorren P. Hill
Facilities Planning and Development Manager

COUNTY OF MARIN
SAN RAFAEL, CALIFORNIA 94923

MAY 2021
NOTICE IS HEREBY GIVEN that sealed Proposals will be received by the Board of Supervisors, County of Marin, Administration Building, 3501 Civic Center Drive, Room 329, San Rafael, California 94903, until Wednesday, July 21, 2021, 1:30 PM for: Marin Center Exhibit Hall Seismic Retrofit, Project No. CAP 19-1101, for which a A or B license will be required.

Project Description: The project will address structural deficiencies within the Marin Center Exhibit Hall that may pose a risk to Life Safety and/or Building Collapse in the event of an earthquake. The project will strengthen connections between the structure's concrete masonry walls, steel and wood roof structural elements, and roofing membrane through the installation of additional wall anchors and cross-ties, and the placement of supplemental support columns in key locations. The project includes code required accessibility upgrades. Demolition will include some hazardous material abatement.

A site walk will be held at the Marin Center Exhibit Hall located at 10 Avenue of the Flags, San Rafael, on Wednesday, July 7, 2021 at 1:00 PM.

The Engineer's estimated cost for the accomplishment of this work is $1,840,000.

The work shall be done in accordance with plans and specifications which may be acquired at no cost in electronic format via Google Bid Doc Folder. Contractors can request bid documents by completing the following Bid Document Request Form: https://bit.ly/3blWuvA. By completing this form, you will automatically be added to the Plan Holder’s List and given access to the Bid Docs Folder which includes plans, specs, NTC, Plan Holder’s List and addendums if applicable. Mailed requests shall be addressed to the Department of Public Works, County of Marin, P.O. Box 4186, Civic Center, San Rafael, California 94913. For questions regarding the project, and/or plans & specifications, call (415) 473-7877 or visit https://www.marincounty.org/main/bids-and-proposals.

Complimentary electronic copies of the Project Drawings, Specifications and other Bid Documents may be acquired by prospective Bidders by emailing bids@marincounty.org. Hard copies of the Project Drawings, Specifications and other Bid Documents may be acquired by prospective Bidders at The Marin County Department of Public Works room 304 upon payment of $50 per set (cash, or check made payable to the County of Marin) to cover the cost of printing and processing, which payment is NON-REFUNDABLE, and the documents need not be returned. There will be a $12.00 service fee for returned checks. Mailed requests should be addressed to the Marin County Department of Public Works, County of Marin, Attention: Capital Projects Division, P.O. Box 4186, Civic Center Branch, San Rafael, California 94913-4186.
5. For detailed information regarding the scope of the Project, Bidders may contact the Capital Projects Division of the Marin County Department of Public Works; telephone number 415-497-3196.

6. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 of the Labor Code at the time the contract is awarded. This project is subject to compliance monitoring by the Department of Industrial Relations.

7. All Bids must be submitted on the Proposal Form bound in the Project Manual, or a copy thereof, and must be accompanied with a Proposal Guaranty of at least 10% of the amount of the Base bid.

8. Sealed Proposals will be received until the time and in the place stated above, and shortly thereafter will be **publicly opened and read aloud in Room 404**, Administration Building, Marin County Civic Center.

9. The award of the Contract, if it be awarded, will be to the lowest responsible Bidder whose Proposal complies with the prescribed requirements, and will be made within thirty (30) calendar days after the bid opening. The Board of Supervisors reserves the right to reject any or all bids and to waive any irregularity in any bid received.

10. Sealed Proposals will be received until the time and in the place stated above, and shortly thereafter will be **publicly opened and read aloud in Room 404**, Administration Building, Marin County Civic Center.

11. Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates for Marin County where the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Department of Public Works, and are also available at the State of California Division of Labor Statistics and research web site at [http://www.dir.ca.gov/DLSR/PWD/index.htm](http://www.dir.ca.gov/DLSR/PWD/index.htm).

12. The County of Marin, and its Contractors and/or Subcontractors will not discriminate against any individual based on race, color, religion, nationality, sex, age or disability.

Matthew Hymel  
Clerk of the Board of Supervisors  
County of Marin
INSTRUCTIONS TO BIDDERS

1. DETAILED REQUIREMENTS

Unless otherwise noted, bidders shall refer to Division 2 of the General Conditions for a more detailed review of the main requirements hereof.

2. DEFINITIONS

Reference is made to Division 1 of the General Conditions for a list of definitions applicable to the contract.

3. COMPETENCY OF BIDDERS

All bidders and their subcontractors shall be licensed at the time of the bid date by the Contractors State License Board of the State of California to perform the work herein described, if such work lawfully requires such licensing.

4. ACQUISITION OF BID DOCUMENTS

Reference is made to the Notice to Contractors for instructions on how to acquire bid documents for this project.

5. EXAMINATION OF BID DOCUMENTS AND SITE INSPECTION

A. Before preparing his Proposal the bidder shall carefully examine the drawings, read the specifications and other bid documents, and visit the site of the work to fully familiarize himself/herself with all existing conditions. He/she shall be prepared to accomplish the work within the existing limitations and shall include in his Bid a sum to cover the cost of all items included in the project.

B. Failure or neglect to follow this procedure shall not relieve the bidder of his/her responsibilities nor entitle him/her to additional compensation for work overlooked and not included in his/her bid.

C. Unless noted otherwise in the specifications, the bidder shall make at least two (2) days advance arrangements for the Site inspection with the project designer to assure access.

6. ERRORS IN BID DOCUMENTS

Should a bidder find discrepancies in or omissions from the drawings or specifications, or should he be in doubt as to their meaning, he shall at once notify the Department of Public Works and, should it be found necessary, a written Addendum will be sent to all bidders. The Department of Public Works will not be responsible for any oral instructions.
7. CHANGES TO BID DOCUMENTS

Every interpretation of, change to, addition to or correction of the drawings, specifications or other bid documents will be in the form of an Addendum which, when issued, will be on file at the Department of Public Works at least (2) Working Days prior to the bid opening. In addition, all Addenda will be mailed to each party holding bid documents, although it shall be the bidder's responsibility to make inquiry as to the Addenda issued. All such Addenda shall become part of the contract documents and all bidders shall be bound by such Addenda whether or not received by them.

8. PREBID CONFERENCE

A conference may be held within the week prior to the bid opening in order to clarify the conditions and requirements of the project. If so, all prospective bidders will be verbally notified of the exact time and location of this conference at least two (2) Working Days in advance, with following written confirmation.

9. PRODUCT SUBSTITUTIONS

A. Written request for approval of any product substitution shall be submitted to the Department of Public Works by the bidder at least five (5) Working Days before the date of the bid opening. The request shall contain all information necessary for a proper comparison and evaluation, including a description of any change to the work necessitated by acceptance of such substitution.

B. Acceptance of a substitution by the County will be confirmed through the issuance of an Addendum. Bidders shall not rely upon approval made in any other manner.

10. SUBCONTRACTORS

A. Each portion of the work shall be performed by an organization knowledgeable and experienced in that particular field. No such portion shall be reserved by the bidder to perform himself unless he/she is fully equipped and sufficiently skilled to handle it properly. Each bid shall include a complete list of the categories of the work and the subcontractor proposed for each.

B. No part of the contract or of the subcontracts shall be assigned, transferred to or sublet without the written consent of the County.

C. If the bidder fails to specify a subcontractor for any portion of the work, he/she shall be deemed to have agreed to perform such portion himself/herself. He/she shall not be permitted to subcontract that part of the work except in cases of public emergency or necessity, and then only after the finding of the awarding authority has been publicly recorded.
11. AFFIRMATIVE ACTION

Each bidder is encouraged to utilize good faith efforts to seek and consider minority and women's business enterprises in the award of his subcontracts to the fullest extent consistent with the efficient performance of the work and shall enter the results of such efforts in his Proposal.

12. BID PREPARATION

A. To receive consideration, bids must be made in accordance with the following instructions:

1. The bids shall be submitted in single copy on the form provided herein, or a duplicate thereof. No other bid form will be considered. Additional forms may be obtained from the office of the Department of Public Works.

2. The bids shall not contain any recapitulations of the work to be done, and alternative Proposals will not be considered unless called for. No telegraphic or telephone Proposals or modifications to Proposals will be considered.

3. The bidders shall calculate payment for all sales, unemployment, old age pension and other taxes imposed by local, city, state or federal law, and shall include such expenses in the total amount bid.

4. All prices and notations shall be typed or written legibly in ink. Numbers shall be entered in both writing and figures, rounded to the nearest dollar. In a case of discrepancy between words and figures, words shall prevail, although the Board of Supervisors reserves the right to construe the bid according to its true intent where it contains a patent mistake.

5. Mistakes may be crossed out and corrections inserted adjacent, if initialed by the person signing the bid. No corrections can be made after delivery.

6. Each bid must contain the full business address of the bidder and must be signed by him/her with his/her usual signature.

7. Bids by partnerships must include the full names of all partners and be signed with the partnership name by one of the partners or by an authorized representative, followed by the name and title of the person signing.

8. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature of an officer acting in the corporate name, with corporate seal affixed. The names of the corporation president, secretary, treasurer and manager must be listed.
9. The name and title of each person signing shall also be typed or printed with his signature.

10. All names shall be the same as those appearing on bidder's contractor license.

11. In accordance with the federal requirements for taxable miscellaneous income reporting, each bidder, unless a corporation, shall enter his Social Security number or federal tax identification number.

12. Each bid shall be enclosed in a sealed opaque envelope bearing the title of the project and the business name of the bidder and shall be delivered to the person named by the time set for the receiving of bids in the Notice to Contractors.

B. Each bidder should be especially careful to follow these instructions, and to complete all details and fill in all blanks in the Proposal form in a clear and legible manner. Failure to do so could be cause for rejection of his bid.

13. BID SECURITY

All Bids shall be accompanied by a Personal Guaranty, made payable to the County of Marin, in an amount equal to at least ten percent (10%) of the base bid, unless specified otherwise in the Notice to Contractors. The Proposal Guaranty shall be in the form of an unconditional certified or cashier's check, a bank or postal money order, or a bid bond executed, as surety, by an organization authorized to issue surety bonds in the state of California.

14. BID WITHDRAWAL

Bidders may withdraw their Proposals at any time prior to, but not later than, the hour fixed for the receiving of bids. Unless otherwise required by law, bids not so withdrawn may not then be withdrawn for a period of thirty (30) calendar days after the date set for the opening thereof. Negligence on the part of the bidder in the preparation of his bid confers no rights for the withdrawal of the bid after it has been opened, except as follows:

Any bidder claiming a bidding error and seeking relief there from shall follow the procedure described in Article 2.12 of the General Conditions.

15. MULTIPLE BIDS

No person, firm or corporation shall be allowed to make, file or be interested in more than one (1) bid for the same project unless such alternate bids are called for. However, a person, firm or corporation who has submitted a sub-Proposal to one bidder is not hereby disqualified from submitting a sub-Proposal or quoting prices to other bidders.

16. BID OPENING
A. Bids are required for the entire work described herein, and neither partial bids nor contingent bids will be considered.

B. No bids will be accepted after the time set for bid delivery.

C. The Proposals will be opened and read aloud at the hour, on the date and in the location stated in the Notice to Contractors. Only the total amount of each bid will be read, and not the specific items making up said total.

D. The bidders will be at liberty to inspect and review the bids in the office of the Department of Public Works.

17. AWARD OF CONTRACT

A. The contract will be awarded to the lowest responsible bidder complying with these instructions, provided his/her bid is reasonable and it is in the interest of the County to accept it. The competency and responsibility of the bidders and of their proposed subcontractors will be considered in making the award. Where and if unit prices are called for, the unit price shall govern in case of extension error. The Board of Supervisors reserves the right to waive any informalities in the bids at his discretion.

B. The Board of Supervisors reserves the right to accept any and all alternative bids called for in the Proposal Form, or any combination thereof, and their order of listing shall in no way indicate the order in which they may be accepted.

C. Notwithstanding the County's authority to accept alternates after the contract has been awarded, the low bid will be determined by the base bid and those alternates, if any, indicated for acceptance at the time of the awarding of the contract.

D. Before commencing the work, the successful bidder must furnish contract bonds and must secure and maintain such insurance policies as are required by law and by the General Conditions of the contract. In this regard, the bidder is directed to Articles 3.04 and 3.05 in the General Conditions.

E. Reference is made to Division 3 of the General Conditions for more thorough information relative to award of the contract.

18. TIME LIMIT AND DAMAGES

A. Unless noted otherwise in the specifications, the contractor shall commence work on or before the tenth (10th) working day following the date of written notification by the Department of Public Works that the contract has been awarded.
B. Within this ten (10) day interval the necessary contract documents shall be acquired, processed and executed by the contractor and transmitted to the Department of Public Works.

C. All work shall be completed on the project within **300 calendar days**, counting from and including the aforementioned day of commencement.

   **The work-window for all onsite construction activities, including cleaning and demobilization, shall close on June 1, 2022.**

D. Should the work not be completed within the allotted time, or within the time limit as may be extended as provided in the General Conditions, loss will be suffered by the County, and the contractor will be assessed damages in the amount of **$500** for each and every working day of unauthorized delay in said contract duration, and **$1,000** for each calendar day where construction activities extend beyond the specified close date of the onsite construction work-window.

E. In the event of undue or excessive hardship resulting from an authorized or inexcusable delay in the completion of the work, the County reserves the right to make a detailed written determination of the losses suffered, and to receive full recompense from the contractor therefor.
Marin Center Exhibit Hall Seismic Retrofit
MARIN COUNTY CIVIC CENTER
SAN RAFAEL, CA.
PROJECT NO. CAP 19-1101

PROPOSAL

Date ___________________ , 202__

Director of Department of Public Works  
Room 404, Administration Building  
Marin County Civic Center  
San Rafael, California 94903

1. AMOUNT: The Undersigned, as Bidder, doing business under the firm name of __________________________________________ having carefully examined the Site of the proposed Work, all conditions thereof and the Bid Documents, hereby proposes and agrees, if this Proposal is accepted, that he will contract with the County of Marin to provide all necessary machinery, tools, apparatus and other means of construction, and all labor, transportation and incidentals, and do all the work and furnish all the materials required to the project that will address structural deficiencies within the Marin Center Exhibit Hall. The work will be done in strict conformity with the Drawings, Specifications and other Bid Documents, including all Addenda thereto, in the manner and time prescribed and according to the requirements of the Engineer as therein set forth, and that he will take in minimum payment therefor the following sum, namely:

   A. BID ITEM NO. 1: MOBILIZATION/DEMOBILIZATION (Lump Sum)  
      All required labor, materials, transportation, equipment, incidentals, and services for the above described work, complete for the sum of __________________________________________________________________________________ Dollars (__________________).

   B. BID ITEM NO. 2: SEISMIC RETROFIT (Lump Sum)  
      All required labor, materials, transportation, equipment, incidentals, and services for the above described work, complete for the sum of __________________________________________________________________________________ Dollars (__________________).

   C. BID ITEM NO. 3: ACCESSIBILITY UPGRADES (Lump Sum)  
      All required labor, materials, transportation, equipment, incidentals, and services for the above described work, complete for the sum of __________________________________________________________________________________ Dollars (__________________).
D. TOTAL BASE BID (Sum of Bid Items A, B and C)

(___________________________________________________________ Dollars

(__________________________________________________________).

E. ALTERNATE 3: THEATER LED LIGHTING (Lump Sum)

All required labor, materials, transportation, equipment, incidentals, and services for the
above described work, complete for the sum of

(___________________________________________________________ Dollars

(__________________________________________________________).

2. SUBSTITUTIONS: Reference is made to Article 9 in the Instructions to Bidders for directions
regarding the necessary procedure for seeking approval of a proposed material substitution.

3. TIME:

A. The undersigned hereby agrees that he will, within ten (10) Working Days following
written acceptance of this bid and notification of award by the Department of Public
Works, execute the formal contract agreement with the County. If, however this Proposal
shall be accepted, and the undersigned shall fail to contract as aforesaid, and to furnish
the required contract bonds and insurance, with surety satisfactory to the County, within
ten (10) Working Days after the notification of award, the Board of Supervisors may, at
their option, determine that the bidder has abandoned the contract and thereupon this
Proposal and the acceptance thereof shall become null and void and the security
accompanying this Proposal shall be forfeited to the County.

B. The undersigned hereby further agrees that this bid is based upon completion of the work
within the time limit stipulated in the Instructions to Bidders, and that he will abide by
the damages applicable thereto.

4. SITE AND DOCUMENTS: The undersigned has examined the location of the proposed work
and is familiar with the drawings, specifications and other bid documents, and with the local
conditions of the place where the work is to be done. Acknowledgment is made of the safety
and security requirements of the General Conditions and the specifications.

5. ADDENDA: The undersigned hereby acknowledges receipt of the following Addenda:

_________________________________________________________

_________________________________________________________

6. GENUINE BID: The Undersigned hereby certifies that this bid is genuine and not sham or
collusive, or made in the interest or on behalf of any person or business not herein named, and
that he has not directly or indirectly induced or solicited any other bidder to furnish a sham
bid, or any other person or business to refrain from bidding, and that he has not in any manner
sought by collusion to secure himself an advantage over any other bidder.
7. PROPOSAL GUARANTY: Accompanying this Proposal is ___________________________ Dollars ($ ____________) (certified check, money order or Bid Bond), being an amount equal to at least ten percent (10%) of the total amount bid, as a Proposal Guaranty.

8. LIST OF SUBCONTRACTORS: In compliance with the provisions of the Subletting and Subcontracting Fair Practices Act, California Government Code, Section 4100, et seq., and any amendments thereto, each bidder must list the name, address, license number, of each subcontractor who will perform work or labor, or render service to the bidder, and his portion of the work to be done. Failure to list subcontractors whose work totals more than one half of one percent (1/2%) of the total amount bid may be considered basis for rejection of the bid. Where no subcontractor is listed, the bidder must be qualified and experienced in that field and agrees to execute that portion of the work with his own forces.

<table>
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Attach another sheet if additional space is needed.

9. SIGNING INSTRUCTIONS: Each bid must contain the full business address of the bidder and must be signed by him/her with his usual signature. Bids by partnerships must include the full names of all partners and be signed with the partnership name by one of the partners or by an authorized representative, followed by the name and title of the person signing. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature of an officer acting in the corporate name, with corporate seal affixed. The names of the corporation president, secretary, treasurer and manager must be listed. The name and title of each person signing shall also be typed or printed with his signature. All names shall be the same as those appearing on the bidder's contractor license. The names and titles of all persons interested in this Proposal as Principals are as follows:
Licensed in accordance with an act providing for the registration of contractors:

License No. ______________ Classification(s) ________________________________

Expiration Date ________________________________

Name of Firm ________________________________

Business Address ________________________________

Business Telephone No (____) ________________________________

City of Residence ________________________________

State of Incorporation, if Incorporated ________________________________

In accordance with federal legislation, list social security number or federal tax identification number (unless incorporated) ________________________________

10. CERTIFICATION-PREVAILING WAGE RATES: The bidder has read the Articles in the Notice to Contractors and in the General Conditions with respect to the requirements for paying prevailing wage rates. The bidder hereby certifies that he is aware of the amounts of said prevailing wages as set forth by the Department of Industrial Relations, State of California, and that he will ensure that all workers employed for the project, either by himself or by his subcontractors, are paid not less than such amounts for all work done thereon or connected therewith.

11. TAX, CALIFORNIA NONRESIDENT INCOME & FRANCHISE TAX WITHHOLDING: The California Franchise Tax Board through the California Revenue and Taxation Code (R&TC) Section 18662 and the related regulations requires the withholding of California income and franchise taxes from payment made to nonresident California vendors performing services in this state. A withholding of 7% (the 2011 rate which is applicable to change) of all service related invoices will be withheld and remitted to the state; there is no required withholding on goods provided. In addition, there are higher applicable rates that apply to nonresident foreign non-corporate partners, corporate partners and foreign bank (including financial institution partners).

Non-California Contractor/Vendor Yes _____ No _____
12. ERRORS: The undersigned has carefully checked all of the foregoing figures and other entries and understands that the County will not be responsible for any errors or omissions on the part of the bidder in preparing this Proposal.

________________________________________

Signature and Title of Responsible Official

Dated this___day of ____________________________, 201__
“NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

State of California )

County of ___________________) ss.

To the COUNTY of MARIN

DEPARTMENT OF PUBLIC WORKS

__________________________________, being first duly sworn, deposes and says that he or she is _____________________________ of ___________________ the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.”

Note: The above Noncollusion Affidavit is part of the Proposal.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Place Notary Seal Above

________________________________ Signature of Notary Public

________________________________ Signature of Document Signer
BID BOND

Bid Date ___________________ Bond No. ___________________

KNOW ALL MEN BY THESE PRESENTS, that we, __________________________

; as Bidder (hereinafter call the Principal), and __________________________

___________________________________________________________, a Corporation duly
organized and existing under the laws of the State of ________________ and authorized to
transact a general surety business in the State of California, as Surety (hereinafter called the
Surety), and held and firmly bound unto THE BOARD OF SUPERVISORS OF THE COUNTY
OF MARIN, as Oblige (hereinafter called the Oblige), in the full and just sum of
__________________________________ Dollars ($____________) lawful money of the United
States, said sum being an amount of not less than ten percent (10%) of the total amount of the
Principal's Bid, as said amount is defined in Article 7 in the Proposed form, for the payment of
which sum well and truly to be made the said Principal and the said Surety bond ourselves, our
heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these
presents.

WHEREAS the Principal has submitted a Bid for the Marin Center Exhibit Hall Seismic
Retrofit, PROJECT NO. CAP 19-1101.

NOW THEREFORE, if the Obligee shall accept the Bid of the Principal and the Principal shall
enter into a Contract with the Oblige in accordance with the terms of such Bid, within such time
as may be specified, and give such Bond or Bonds as may be specified in the Bidding or Contract
Documents, with good and sufficient surety for the faithful performance of such Contract and for
the prompt payment for labor and material furnished in the prosecution thereof, or in the event of
the failure of the Principal to enter such Contract in the time prescribed and give such Bond or
Bonds, if the Principal and Surety shall pay unto the Obligee the difference in money, not to exceed
the sum hereof, between the amount specified in said Bid and such larger amount for which the
Obligee may legally and in good faith contract with another party to perform the work covered by
said Bid, then this obligation shall be null and void; otherwise it shall be and remain in full force
and effect.
BID BOND
(continued)

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and the Surety this ___ day of ________________, 201__. 

(To be signed by Principal and Surety, and acknowledgment and Notarial Seal attached)

______________________________
Contractor (Seal)

______________________________  Title
Witness

______________________________
Surety (Seal)

______________________________
Witness

By____________________________
Attorney-in-Fact
DEBARMENT AND SUSPENSION CERTIFICATION

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

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

• is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
• has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
• does not have a proposed debarment pending; and
• has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

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

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

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.
SUBCONTRACTOR DEBARMENT AND SUSPENSION CERTIFICATION

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

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

• is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
• has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
• does not have a proposed debarment pending; and
• has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

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

________________________________________________________________________

Authorized Representative

____________________________________  _____________________________
Name (typed)      Signature

____________________________________  _____________________________
Title       Date

____________________________________  _____________________________
Name of Company     Project Name

BIDDER SHALL SUBMIT A SIGNED “SUBCONTRACTOR DEBARMENT AND SUSPENSION CERTIFICATION” NO LATER THAN 4:00 P.M. ON THE 4TH BUSINESS DAY AFTER BID OPENING FOR EACH SUBCONTRACTOR LISTED IN THE BID. FAILURE TO SUBMIT SUBCONTRACTOR CERTIFICATION MAY DEEM A BID NON-RESPONSIVE.

Notes: The certification of this provision is a material representation of fact upon which reliance was place. Providing false information may result in criminal prosecution or administrative sanctions and the termination of the contract for default.
KNOW ALL MEN BY THESE PRESENTS:

THAT, WHEREAS, THE BOARD OF SUPERVISORS OF THE COUNTY OF MARIN, as Obligee (hereinafter called the Owner), has awarded to ____________________________, as Principal (hereinafter called the Contractor), a Contract for the Marin Center Exhibit Hall Seismic Retrofit, Project No. CAP 19-1101, and

WHEREAS the said Contractor is required under the terms of the said Contract to furnish a Bond for the faithful performance of said Contract,

NOW, THEREFORE, THESE PRESENTS WITNESSETH:

that we, the Contractor, and, ____________________________, a corporation duly organized and existing under the laws of the State of ________________, and authorized under the laws of the State of California to become surety on bonds and undertakings, as Surety (hereinafter called the Surety), are held and firmly bound unto the said Owner in the Penal Sum of ________________ Dollars ($ __________) lawful money of the United States, said sum being an amount of not less than one hundred percent (100%) of the total amount payable by the terms of said Contract, for the payment of which sum well and truly to be made the said Contractor and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, if the above bounden Contractor, 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 said 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 manner therein specified, including guarantees, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the said Owner and its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the Work to be performed
PERFORMANCE BOND  
(continued)

thereunder, or to the Drawings or the Specifications accompanying 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.

Whenever the Contractor shall be, and be declared by the Owner to be in default under the Contract, the Owner having performed its obligations thereunder, the Surety shall promptly remedy the default, or shall promptly complete the Contract in accordance with its terms and conditions, or shall promptly obtain Bids for completing the Contract according to its terms and conditions, and upon determination by the Owner and the Surety, jointly, of the lowest responsible Bidder, arrange for a Contract between such Bidder and the Owner, and make available as the Work progresses sufficient funds to pay the cost of completion, less the total amount payable by the Owner to the Contractor under the Contract and any amendments thereto (less the amount already properly paid by the Owner to the Contractor); but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the aggregate sum specified in this Bond.

No right of action shall accrue under this Bond to or for the use of any person or organization other than the Owner named herein or its heirs, executors, administrators or successors.

IN WITNESS WHEREOF, this instrument has been duly executed by the Contractor and the Surety this day of ____________, ____________, 201__.

(To be signed by Contractor and Surety, and acknowledgment and Notarial Seal attached)

Witness

Witness

Witness

MAILING ADDRESS OF SURETY ________________________________
PAYMENT BOND
PUBLIC WORK

Bond No.____________________

KNOW ALL MEN BY THESE PRESENTS:

THAT, WHEREAS, THE DEPARTMENT OF PUBLIC WORKS OF THE COUNTY OF
MARIN, as Obligee (hereinafter called the Owner), has awarded to___________________________
__________________________ as Principal (hereinafter called the Contractor), a Contract for Marin
Center Exhibit Hall Seismic Retrofit, Project No. CAP 19-1101, and

WHEREAS, pursuant to law, the said Contractor is required before entering upon the performance
of the Work to file a good and sufficient Bond with the body by whom the Contract is awarded to
secure the payment of claims of laborers, mechanics, material suppliers and other persons to whom
reference is made in Section 3181 of the Civil Code of the State of California,

NOW, THEREFORE, THESE PRESENTS WITNESSETH:

that we, the Contractor, and__________________________, a corporation duly organized
and existing under the laws of the State of__________________, and authorized under the laws of
the State of California to become surety on bonds and undertakings, as Surety (hereinafter called
the Surety), are held and firmly bound unto the said Owner in the Penal Sum of____________________
($______) lawful money of the United States, said sum being an amount of not less than one
hundred percent (100%) of the total amount for the payment of which sum well and truly to be
made the said Contractor and the said Surety bind ourselves, our heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, if the above bounden Contractor, his or
its heirs, executors, administrators, successors or assigns, or Subcontractors, shall fail to pay any
claimant named in Civil Code Section 3181, or amounts due under the Unemployment Insurance
Act with respect to work or labor performed by any such claimant, or any amounts required to be
deducted, withheld and paid over to the Franchise Tax Board from the wages of employees of the
Contractor or his Subcontractors pursuant to Section 18806 of the Revenue and Taxation Code,
with respect to such work and labor, that the Surety on this Bond will pay the same in an amount
not exceeding the aggregate sum hereinabove set forth, and also, in case suit is brought upon this
Bond, will pay a reasonable attorney's fee to be fixed by the Court, taxed as costs and awarded to
the prevailing party in said suit.
PAYMENT BOND
(continued)

It is hereby expressly stipulated and agreed that this Bond shall inure to the benefit of any of the persons named in Section 3181 of the Civil Code of the State of California so as to give a right of action to them or their assigns in any suit brought upon this Bond. Should the conditions of this Bond be fully performed, then the obligation hereunder shall become null and void; otherwise it shall be and remain in full force and effect.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the Work to be performed thereunder, or to the Drawings or the Specifications accompanying 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.

This Bond is executed and filed to comply with the provisions of an act of the Legislature of the State of California as designated in the Civil Code, Sections 3247 to 3252, inclusive, and all amendments thereto.

IN WITNESS WHEREOF, this instrument has been duly executed by the Contractor and the Surety this ___ day of __________________, 201__.

(To be signed by Contractor and Surety, and acknowledgment and Notarial Seal attached)

Witness

______________________________

Witness

______________________________

Witness

______________________________

Witness

______________________________

Witness

______________________________

Witness

______________________________

Contractor (Seal)

______________________________

Surety (Seal)

______________________________

By____________________________

Attorney-in-Fact

MAILING ADDRESS OF SURETY ________________________________

______________________________
THIS AGREEMENT is entered into this ______ day of ____________________201__ by and between the COUNTY OF MARIN, a political subdivision of the State of California, hereinafter called the Owner or First Party, and __________________________ hereinafter called the Contractor or Second Party.

WITNESSETH that the Owner and the Contractor, in consideration of premises and mutual covenants, considerations and the agreement herein contained, do hereby agree as follows:

1. STATEMENT OF WORK: The Contractor shall furnish all labor and materials, equipment and services, and shall perform and complete all work required to the project that will address structural deficiencies within the Marin Center Exhibit Hall that may pose a risk to Life Safety and/or Building Collapse in the event of an earthquake. The project will strengthen connections between the structure's concrete masonry walls, steel and wood roof structural elements, and roofing membrane through the installation of additional wall anchors and cross-ties, and the placement of supplemental support columns in key locations. The project includes code required accessibility upgrades. Demolition will include some hazardous material abatement. The work will be done in strict accordance with the Contract Documents as adopted by the Owner and prepared by the Marin County Department of Public Works.

2. CONTRACT DOCUMENTS: The Contract Documents consist of the following, all of which are as fully a part hereof as if herein set out in full and, if not attached hereto, the same as if hereto attached:

   A. The accepted Proposal of the Contractor.
   B. The fully executed Performance Bond and Payment Bond, if required.
   C. Workers Compensation, Public Liability and Property Damage Insurance, as required from the Contractor pursuant to the terms of the Contract.
   D. This Agreement.
   E. The General Conditions.
   F. The Specifications and the Drawings and all authorized modifications thereof and Addenda thereto.

3. DURATION OF WORK: The Work shall be commenced no later than the date specified by written order of the Owner, and shall be completed within 300 calendar days from said date, or within the time as may be adjusted under the terms of the Contract.
4. CONTRACTOR'S COMPENSATION: The Owner will pay and the Contractor will accept, in full consideration for the performance of the Contract, subject to additions and deductions as provided therein, the sum of __________________________ ($_________________), said sum being the total of the Contractor's Base Bid and the following additive and/or deductive Alternates. Alternate Bid TBD

IN WITNESS WHEREOF, the parties hereto on the day and year first above written have executed this Agreement in three (3) identical counterparts, each of which shall for all purposes and without proof or accounting for the other counterparts be deemed an original thereof.

COUNTY OF MARIN
A Political Subdivision of the State of California

By __________________________
President, Board of Supervisors
FIRST PARTY

ATTEST:

Deputy Clerk, Board of Supervisors

__________________________
(Firm)

By __________________________
SECOND PARTY
FEDERAL PROVISIONS ADDENDUM

Construction Services for the
Marin Center Exhibit Hall Seismic Retrofit

This Exhibit is incorporated into the Agreement entered into between Contractor and County.

I. DEFINITIONS
   a. Government means the United States of America and any executive department or agency thereof.
   c. Third Party Subcontract means a subcontract at any tier entered into by Contractor or subcontractor, financed in whole or in part with Federal assistance originally derived from FEMA.

II. FEDERAL COMPLIANCE
   a. This is an acknowledgement that FEMA financial assistance will be sought and if available used to fund all or a portion of the Agreement. Contractor shall at all times comply with all applicable regulations, policies, procedures, and FEMA Directives as they may be amended or promulgated from time to time during the term of this Agreement, including but not limited to those requirements of 2 CFR 200.317 through 200.326 and more fully set forth in Appendix II to Part 200 – Contract Provisions for non-Federal Entity Contracts Under Federal Awards, which is included herein for reference. Contractor’s failure to so comply shall constitute a material breach of the Agreement.
   b. Contractor agrees to include the above clause in each third-party subcontract financed in whole or in part with Federal assistance provided by FEMA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

III. CLEAN AIR ACT (applicable to all contracts and subcontracts in excess $100,000, including indefinite quantities where the amount is expected to exceed $100,000 in any year)
   a. Contractor agrees to comply with all applicable standards, orders, or regulations pursuant to the Clean Air Act, as amended, 42 U.S.C. Section 7401 et seq.
   b. Contractor agrees to report each violation to The County of Marin and understands and agrees that the County of Marin will, in turn, report each violation to the FEMA, and the appropriate Environmental Protection Agency Regional Office.
   c. Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

IV. FEDERAL WATER POLLUTION CONTROL ACT (applicable to all contracts and subcontracts in excess $100,000, including indefinite quantities where the amount is expected to exceed $100,000 in any year)
   a. Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
   b. Contractor agrees to report each violation to the County of Marin and understands and agrees that the County of Marin will, in turn, report each violation to FEMA, and the appropriate Environmental Protection Agency Regional Office.
   c. Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.
V. BYRD ANTI-LOBBYING AMENDMENT 31 U.S.C. §1352 (as amended)
   a. Contractor shall not use or pay any funds received under this Agreement to influence or attempt to
      influence an officer or employee of an agency, a Member of Congress, an officer or employee of
      Congress, or an employee of a Member of Congress in connection with the awarding of any Federal
      contract, the making of any Federal contract, the making of any Federal grant, the making of any
      Federal loan, the entering into of any cooperative agreement, and the extension, continuation,
      renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
   b. Contractor agrees to the provisions of Attachment 1, Certification Regarding Lobbying, attached
      hereto and incorporated herein (applicable for contracts or subcontracts in excess of $100,000).
   c. Contractor agrees to include paragraphs a. and b. above in each third-party subcontract financed in
      whole or in part with Federal assistance provided by FEMA. It is further agreed that the clause shall
      not be modified, except to identify the subcontractor who will be subject to its provisions.

VI. PROCUREMENT OF RECOVERED MATERIALS
   a. In the performance of the Agreement, Contractor shall make maximum use of products containing
      recovered materials that are EPA-designated items unless the product cannot be acquired-
      i. Competitively within a timeframe providing for compliance with the contract performance
         schedule;
      ii. Meeting contract performance requirements;
      iii. At a reasonable price.
   b. Information about this requirement, along with the list of EPA-designated items, is available at EPA’s
      Comprehensive Procurement Guidelines website. https://www.epa.gov/smm/comprehensive-
      procurement-guideline-cpg-program
   c. Contractor also agrees to comply with all other applicable requirements of Section 6002 of the “Solid
      Waste Disposal Act”.

VII. DEBARMENT AND SUSPENSION CLAUSE
   a. The Agreement and this Exhibit is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R.
      pt. 3000. As such, Contractor is required to verify that none of Contractor’s principals (defined at 2
      C.F.R. §180.995) or its affiliates (defined at 2 C.F.R. §180.905) are excluded or disqualified (defined
      at 2 C.F.R. §180.935).
      include a requirement to comply with these regulations in any lower tier covered transactions it enters
      into.
   c. This certification is a material representation of fact relied upon by the County of Marin. If it is later
      determined that Contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000,
      subpart C, in addition to the remedies available to the County of Marin, the Federal Government may
      pursue available remedies, including but not limited to suspension and/or debarment.
   d. The bidder or proposer agrees to comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000,
      subpart C while the offer is valid and throughout the period of any contract that may arise out of this
      offer. The bidder or proposer agrees to include such compliance in its lower tier covered transactions.

VIII. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (applicable to all contracts in excess of
      $100,000 that involve the employment of mechanics or laborers or other construction work, but not to
      purchases of supplies or materials or articles ordinarily available on the open market, or contracts for
      transportation or transmission of intelligence)
a. **Overtime requirements:** No contractor or subcontractor contracting for any part of the contract work, which may require or involve the employment of laborers or mechanics, shall require or permit any such laborer or mechanic in any workweek, in which he or she is employed on such work, to work in excess of forty (40) hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one (1) and one-half (1/2) the basic rate of pay for all hours worked in excess of forty (40) hours in such workweek.

b. **Violation; liability for unpaid wages; liquidated damages:** In the event of any violation of the clause set forth in VII(a) of this section Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen or guards, employed in violation of the clause set forth in VIII(a) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty (40) hours without payment of the overtime wages required by the clause set forth in VIII(a) of this section.

c. **Withholding for unpaid wages or liquidated damages:** the County of Marin shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by Contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in VIII(b) of this section.

d. **Subcontracts:** Contractor or subcontractor shall insert in any subcontracts the clauses set forth in VIII(a) through (d) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in VIII(a) through (d) of this section.

IX. **DEPARTMENT OF HOMELAND SECURITY SEAL, LOGOS, FLAGS**

a. Contractor shall not use the Department of Homeland Security (DHS) seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA approval.

X. **ACCESS TO RECORDS**

a. Contractor agrees to provide the County of Marin, the FEMA administrator, the Comptroller General of the United States, or any of their authorized representative access to any books, documents, papers, and records of Contractor which are directly pertinent to the Agreement for the purposes of making audits, examinations, excerpts and transcriptions.

b. Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

c. Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the Agreement.

d. In compliance with the Disaster Recovery Act of 2018, the County of Marin and Contractor acknowledge and agree that no language in the Agreement is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.
XI. NO OBLIGATION BY FEDERAL GOVERNMENT
   a. The Federal Government is not a party to the Agreement or this Exhibit and is not subject to any
      obligations or liabilities to the non-Federal entity, contractor or any other party pertaining to any
      matter resulting from the contract.
   b. Contractor agrees to include the above clause in each third-party subcontract financed in whole or in
      part with Federal assistance provided by FEMA. It is further agreed that the clause shall not be
      modified, except to identify the subcontractor who will be subject to its provisions.

XII. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS
    a. Contractor acknowledges that the 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and
       Statements) applies to Contractor’s actions pertaining to the Agreement.

XIII. TERMINATION FOR CAUSE
      Contractor’s failure to perform or observe any term, covenant or condition of this Exhibit shall constitute an
      event of default under the Agreement and County may terminate the Agreement.

XIV. EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE (applicable to all construction contracts
      awarded meeting the definition of “federally assisted construction contract” under 41 CFR 61-1.3).
    a. During the performance of the Agreement, Contractor agrees as follows:
       i. Contractor will not discriminate against any employee or applicant for employment because of
          race, color, religion, sex, sexual orientation, gender identity, or national origin. Contractor will
          take affirmative action to ensure that applicants are employed, and that employees are treated
          during employment without regard to their race, color, religion, sex, sexual orientation, gender
          identity, or national origin. Such action shall include, but not be limited to the following:
          Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or
          termination; rates of pay or other forms of compensation; and selection for training, including
          apprenticeship. Contractor agrees to post in conspicuous places, available to employees and
          applicants for employment, notices to be provided setting forth the provisions of this
          nondiscrimination clause.
       ii. Contractor will, in all solicitations or advertisements for employees placed by or on behalf of
           Contractor, state that all qualified applicants will receive consideration for employment without
           regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
       iii. Contractor will not discharge or in any other manner discriminate against any employee or
           applicant for employment because such employee or applicant has inquired about, discussed, or
           disclosed the compensation of the employee or applicant or another employee or applicant. This
           provision shall not apply to instances in which an employee who has access to the compensation
           information of other employees or applicants as a part of such employee's essential job functions
           discloses the compensation of such other employees or applicants to individuals who do not
           otherwise have access to such information, unless such disclosure is in response to a formal
           complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including
           an investigation conducted by the employer, or is consistent with Contractor's legal duty to
           furnish information.
       iv. Contractor will send to each labor union or representative of workers with which he has a
           collective bargaining agreement or other contract or understanding, a notice to be provided
           advising the said labor union or workers' representatives of Contractor's commitments under this
           section, and shall post copies of the notice in conspicuous places available to employees and
           applicants for employment.
v. Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

vi. Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

vii. In the event of Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

viii. Contractor will include the portion of the sentence immediately preceding paragraph (i) and the provisions of paragraphs (i) through (viii) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, Contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance. The applicant further agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.
XV. ANTI-KICKBACK ACT COMPLIANCE (applicable to all contracts and subgrants for construction or repair above $2,000 where the Davis-Bacon Act also applies; 44 CFR §13.36(i)(4))
   a. Contractor agrees to comply with the Copeland “Anti-Kickback” Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR Part 3), as may be applicable, which are incorporated by reference into the Agreement.
   b. Contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
   c. A breach of the contract clauses above may be grounds for termination of the Agreement, and for debarment as a contractor or subcontractor as provided in 29 C.F.R. § 5.12.

XVI. DAVIS-BACON ACT COMPLIANCE (applicable to construction contracts in excess of $2,000 awarded by grantees and subgrantees when required by Federal grant program legislation;)
   a. To the extent required by any Federal grant programs applicable to expected funding or reimbursement of County’s expenses incurred in connection with the services provided under the Agreement, Contractor agrees to comply with the Davis-Bacon Act (40 U.S.C. 276a to 276a–7) as supplemented by Department of Labor regulations (29 CFR Part 5) as set forth below. These requirements are in addition to the requirements set forth in the Agreement.
   b. Contractor shall be bound to the provisions of the Davis-Bacon Act and agrees to be bound by all the provisions of Labor Code section 1771 regarding prevailing wages. All labor on this project shall be paid neither less than the greater of the minimum wage rates established by the U.S. Secretary of Labor (Federal Wage Rates), or by the State of California Director of Department of Industrial Relations (State Wage Rates). Current DIR requirements may be found at http://www.dir.ca.gov/lcp.asp.

XVII. PATENT RIGHTS (applicable to contracts for experimental, research, or development projects financed by FEMA)
   a. General. If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under the Agreement, and that invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, the County and Contractor agree to take actions necessary to provide immediate notice and a detailed report to FEMA.
   b. Unless the Government later makes a contrary determination in writing, irrespective of Contractor's status (a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual), the County and Contractor agree to take the necessary actions to provide, through FEMA, those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” 37 CFR, Part 401.
   c. Contractor agrees to include paragraphs a. and b. above in each third-party subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FEMA.

XVIII. INCORPORATION OF UNIFORM ADMINISTRATIVE REQUIREMENTS
   a. The preceding provisions include, in part, certain standard terms and conditions required by FEMA, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by FEMA are hereby incorporated by reference. Anything to the contrary herein
notwithstanding, all FEMA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in the Agreement. Contractor shall not perform any act, fail to perform any act, or refuse to comply with any County requests that would cause County to be in violation of the FEMA terms and conditions.
CERTIFICATION REGARDING LOBBYING
Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

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

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loan, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

______________________________  ______________________________
Contractor Signature             Date
PAYMENT REQUEST

PROJECT: Marin Center Exhibit Hall
Seismic Retrofit
CAP 19-1101

REQUEST NO. [______]  DATE: [______________]

Project No. CA16710

ENGINEER: [______] Owners Copies ( )

CONTRACTOR: [______] Contractor's Copy
[______] Architect's Copy
[______] Inspector's Copy
[______] Other (identify) [______________].

SOCIAL SECURITY NUMBER OR FEDERAL TAX IDENTIFICATION NUMBER:

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<tr>
<th>Original Contract Amount</th>
<th>Percent Complete to Date</th>
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<td>Amount Requested</td>
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SUBMITTED BY [___________________________]
(Contractor)

APPROVED BY [___________________________]
(County of Marin)

APPROVAL DATE [___________________________]
COUNTY OF MARIN

Department of Public Works

COUNTY OF MARIN
DEPARTMENT OF PUBLIC WORKS
ATTENTION: CAPITAL PROJECTS DIVISION
P. O. BOX 4186
SAN RAFAEL, CA  94913-4186

TO:

Please submit a proposal of cost and/or time for the following change to this Project. PLEASE ITEMIZE THE COMPLETE COST BREAKDOWN ON THE OTHER SIDE OF THIS SHEET. (NOTE: This is a request for proposal ONLY and shall not be construed as authority to proceed with the changes noted. This authority can only be granted by your receipt of an official CHANGE ORDER from the County).

By

If the above described change is approved, (add to) (subtract from) the original Contract (amount) (period) the following (sum) (time), namely:

Dollars ($_________)(_____) (calendar) (working) days.

The undersigned proposes to perform or delete the above described work for the above stated resulting additions to and/or deductions from the original Contract, dated______. These additions and/or deductions shall include any modifications of work or additional work that the undersigned may be required to perform by reason of acceptance of this proposal.

Signed________________________________________Date________________________
COUNTY OF MARIN
DEPARTMENT OF PUBLIC WORKS

PROPOSAL CONTRACT CHANGE ORDER NO. _______ REV. NO. _______ SUPPL. NO. _______

PROJECT: Marin Center Exhibit Hall Seismic Retrofit   SHEET 1 OF 1 SHEETS

PROJECT No. CAP 19-1101

To:
You are hereby directed to make the herein described changes from the plans and specifications or do the following described work not included in the plans and specifications on this contract.

NOTE: This change order is not effective until approved by the ASSISTANT DIRECTOR OF PUBLIC WORKS

Description of work to be done, estimate of quantities, and prices to be paid. Segregate between additional work at contract price, agreed price and force account. Unless otherwise stated, rates for rental equipment cover only such time as equipment is actually used and no allowance will be made for idle time.

Change requested by:


The price for all the work described above shall include all work necessary to complete the above referenced tasks, to furnish and install the above referenced components and shall constitute full compensation including overhead for the work of these changes. All work will comply with the Plans, Special Provisions, State Standard Plans, the State Standard Specifications and the Uniform Construction Standards as far as they apply.

Estimated Cost Increase: $____________

By reason of this order the time of completion will be adjusted as follows

Submitted by:__________________________ Date:__________________________

Approval recommended: ____________________________ Date:__________________________

Approved: ASSISTANT DIRECTOR ____________________________ Date:__________________________

We, the undersigned contractor, have given careful consideration to the change proposed and hereby agree, if this proposal is approved, that we will provide all equipment, furnish all materials, except as may be otherwise noted above, and perform all services necessary for the work above specified, and will accept as full payment therefore the prices shown above.

Accepted Date__________________________ Contractor ____________________________

By: __________________________________________ Title: ____________________________

If the contractor does not sign acceptance of this order, his attention is directed to the requirements of the specifications as to proceeding with the ordered work and filing a written protest within the time herein specified.
GENERAL CONDITIONS

DEPARTMENT OF PUBLIC WORKS

COUNTY OF MARIN
## GENERAL CONDITIONS

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DIVISION 1 – DEFINITION OF TERMS

NOTE: Wherever in these General Conditions or in the other Contract Documents the following terms are used, or pronouns in place of them, or initials of organizations, their intent and meaning shall be interpreted as defined herein.

1.01 ABBREVIATIONS OF TRADE SOCIETIES AND RELATED ORGANIZATIONS
In addition to the abbreviations indicated on the Drawings, references in the Contract Documents to trade associations, technical societies, recognized authorities and other institutions may include the following organizations, which are sometimes referred to by only the corresponding abbreviations or initials:

AA     Aluminum Association
AABC    Associated Air Balance Council
AAMA    Architectural Aluminum Manufacturers Association
AASHTO American Association of State Highway and Transportation Officials
ACI     American Carpet Institute
ACI     American Concrete Institute
ADC     Air Diffusion Council
AGA     American Gas Association
AGC     Associated General Contractors of America
AI      Asphalt Institute
AIA     American Institute of Architects
AIEE    American Institute of Electrical Engineers
AISC    American Institute of Steel Construction, Inc.
AISI    American Iron and Steel Institute
AITEC   American Institute of Timber Construction
ALS     American Lumber Standards
AMA     Acoustical Materials Association
AMCA    Air Movement and Control Association
ANSI    American National Standards Institute
APA     American Plywood Associations
ARI     Air-Conditioning and Refrigeration Institute
ASA     American Standards Association
ASCE    American Society of Civil Engineers
ASHRAE  American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.
ASME    American Society of Mechanical Engineers
ASTM    American Society for Testing and Materials
AWI     American Woodwork Institute
AWPI    American Wood Preservers Institute
AWS     American Welding Society, Inc.
AWWA    American Water Works Association
BTA     Brick and Tile Association
<table>
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<td>CAL/OSHA</td>
<td>California Occupational Safety and Health Act</td>
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<tr>
<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
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<td>Electrical Safety Orders</td>
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<td>FGMA</td>
<td>Flat Glass Marketing Association</td>
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<td>FM</td>
<td>Factory Mutual Research corporation</td>
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<td>Federal Specifications of the General Services Administration</td>
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<td>GA</td>
<td>Gypsum Association</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>IFIA</td>
<td>International Fence Industry Association</td>
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<tr>
<td>IMIAC</td>
<td>International Masonry Industry All-Weather Council</td>
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<td>MFMA</td>
<td>Maple Flooring Manufacturers Association</td>
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<td>MI</td>
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<td>MLSFA</td>
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<td>MWI</td>
<td>Metal Window Institute</td>
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<td>NBFU</td>
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1.02 ADDENDUM

A document issued by the County during the bidding period which modifies, supersedes or supplements the Bid Documents.

1.03 AGREEMENT

The document stating the essential terms of the Contract, including the Contract Sum and the Contract Time, executed by the County and the Contractor, which incorporates by reference all of the Contract Documents.

1.04 ALTERNATE

A proposed addition to, change in or deletion from the work of the Base Bid for which the County requires an individual bid price in order to determine the feasibility thereof.

1.05 ALTERNATE BID

An amount stated in the Proposal by the Bidder to be added to or deducted from the amount of the Base Bid for an Alternate described in the Bid Documents.

1.06 ARCHITECT

A duly licensed professional engaged by the Board of Supervisors to design the Project and administer the Work thereof.

1.07 AWARDING AUTHORITY

The Board of Supervisors of the County of Marin as defined in Article 1.14 herein.

1.08 BASE BID

The sum stated in the Bid for which the Bidder offers to perform the Work, exclusive of any Alternate Bids.
1.09 **BID**

The complete written offer of a Bidder to do the Work for a stipulated sum, with any additions or deductions required by the Alternates, made out and submitted on the prescribed form, and properly signed and guarantied.

1.10 **BID BOND**

A Bid Security in the proper form and amount pledging that the Bidder will enter into a contract with the county to perform the Work if his Bid is accepted, and that he will furnish Contract Bonds.

1.11 **BIDDER**

Any properly licensed individual or organization submitting a Proposal for the Work, acting directly of through a duly authorized representative.

1.12 **BID DOCUMENTS**

The Notice to Contractors, Instructions to Bidders, Proposal form, sample Bid Bond, sample Contract Bonds, these General Conditions, and the Drawings and Specifications and all Addenda thereto.

1.13 **BID SECURITY**

A Bid Bond, or a certified or cashier’s check, or a bank or postal money order, in lieu thereof.

1.14 **BOARD OF SUPERVISORS**

The governing body of the county of Marin or, if applicable, the Board of Supervisors sitting as the governing body of the public entity awarding the Contract, including but not limited to the Board of Supervisors of the Marin County Flood Control and Water Conservation District and the Board of Supervisors of the Marin County Open Space District.

1.15 **CHANGE ORDER**

A written agreement signed by the County and the Contractor, issued after execution of the Contract, providing for alterations, amendments of extensions thereto.

1.16 **CONTRACT**

The agreement between the County and the contractor for the Work of the Project, including the labor, materials and equipment to be furnished, the duration thereof, the payment to be made therefor, and incorporating all of the Contract Documents.
1.17 CONTRACT BONDS

Contract security in the proper forms and amounts pledging that the Contractor will faithfully perform the Work and will pay all obligations for labor and materials arising thereunder.

1.18 CONTRACT DOCUMENTS

The Contractor’s accepted Proposal, the Contract Bonds, Workers’ Compensation Insurance, Public Liability and Property Damage Insurance in the required amounts, the Agreement, these General Conditions, and the Drawings and Specifications and all authorized modifications thereof and Addenda thereto. The Notice to Contractors and the Instructions to Bidders are included by implication.

1.19 CONTRACTOR

The Prime Contractor. The duly licensed individual or organization who has entered into a Contract with the County to perform the Work.

1.20 CONTRACTORS LICENSE

A trade license issued by the Contractors State License Board of the California State Department of Consumer Affairs authorizing the licensee to publicly engage in a specific type of construction endeavor.

1.21 CONTRACT SUM

The total amount payable by the County to the Contractor for the performance of the Work under the Contract Documents, subject to mutually agreed upon additions or deductions as provided for therein.

1.22 CONTRACT TIME

The period of time allotted the Contractor to perform and complete the Work under the Contract Documents, subject to mutually agreed upon extensions or reductions as provided for therein.

1.23 COUNTY

The County of Marin, a political subdivision of the State of California or, if applicable, the public entity awarding the Contract by action of the Board of Supervisors sitting as the governing body of such public entity, including but not limited to the Marin County Flood Control and Water Conservation District and the Marin County Open Space District, except as provided in Article 3.05, “Indemnity and Insurance Requirements”, herein.
1.24 DAMAGES

Liquidated Damages.

1.25 DRAWINGS

The official Project Drawings adopted and approved by the Board of Supervisors, showing the location, character and dimensions of the Work, and including, as required, plans, elevations, sections, details, diagrams, General Notes, information and schedules. Exact reproductions thereof.

1.26 ENGINEER

The Director of the Department of Public Works of the County of Marin, acting on behalf of the County, or ex officio as engineer of the awarding entities as described under the definition of “County”, or his authorized agents acting within the scope of his authority, who shall act as the representative to the County during the term of the Contract.

1.27 FORCE ACCOUNT WORK

Work ordered to be done on the Project without prior agreement as to the cost thereof, and paid for at the actual certified costs to the Contractor for labor, materials and equipment directly required for the performance of such added work, plus stipulated percentages thereof for overhead, profit and bonds.

1.28 GENERAL CONDITIONS

This portion of the Contract Documents, which defines, sets forth or relates to the Contract terminology, and to the rights and responsibilities of the contracting parties and of others involved in the Work. Provisions of a general, non technical nature.

1.29 GENERAL NOTES

The written instructions, provisions, conditions or other requirements appearing on the Drawings, and so identified thereon, which pertain to the performance of the Work.

1.30 INSPECTOR

The Engineer (reference is made, also, to Articles 1.26 and 5.02, herein).

1.31 LEGAL HOLIDAYS

County offices are closed on 1 January (New Year’s Day), the third Monday in January (Dr. Martin Luther King, Jr.’s. birthday observance), the third Monday in February (Presidents Day), the last Monday in May (Memorial Day), 4 July (Independence Day), the first Monday in September (Labor Day), 11 November (Veterans Day), the fourth Thursday in November (Thanksgiving Day), the day following Thanksgiving Day, 24
December starting at noon, 25 December (Christmas Day), 31 December starting at noon, the Friday preceding a Saturday holiday, the Monday following a Sunday holiday and every day declared by the President or the Governor to be a legal holiday.

1.32 LIQUIDATED DAMAGES

The fixed sum per day specified in the contract, or the actual detailed determination of loss suffered by the County, that the Contractor will pay to the County for his failure to complete the Work within the Contract Time. Also, the Bid Security forfeited by the awarded Bidder to the County should he fail or refuse to execute the Contract.

1.33 OWNER

The County of Marin. The Board of Supervisors thereof. Reference is made, also, to Articles 1.14 and 1.23, herein.

1.34 PENAL SUM

The amount named in the Contract Bonds as the damages to be paid by the County by the Contractor in the event he fails to perform his contractual obligations as defined therein.

1.35 PERMIT

A document issued by the County, or by the municipality having jurisdiction, to authorize specific work by the applicant. On work to be performed by the County the Permit is issued free of charge.

1.36 PRODUCT DATA

Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate and define a material, product or system for some portion of the Project.

1.37 PROJECT

The total job, as prescribed in the Contract Documents.

1.38 PROJECT DESIGNER

The Capital Projects Division of the Marin County Department of Public Works. Also, where applicable, the Architect.

1.39 PROJECT MANUAL

The bound volume containing the Project bidding requirements, Contract forms, General Conditions and Specifications.
1.40 PROPOSAL

A Bid.

1.41 PROPOSAL GUARANTY

The Bid Security.

1.42 RETENTION

Retainage. The sum withheld from the Contractor’s progress payments as part security for the detailed completion of the Work, and released after thirty-five (35) calendar days following the filing of the Notice of Completion.

1.43 SAMPLES

Physical samples of materials, equipment or workmanship furnished by the Contractor or offered for inspection by the County to establish standards by which the Work will be judged.

1.44 SHOP DRAWINGS

Drawings, diagrams, schedules and other data specially prepared for the Project by the Contractor or a Subcontractor to illustrate how specific portions of the Work will be fabricated and/or installed.

1.45 SITE

The job site. The location where the Work is to be performed.

1.46 SPECIFICATIONS

The technical written description of the Work, including the scope thereof, materials to be used, methods of installation and quality of workmanship.

1.47 SUBCONTRACT

An agreement between the Contractor and a Subcontractor for the performance of a portion of the Work.

1.48 SUBCONTRACTOR

A duly licensed individual or organization who has a direct contract with the Contractor to perform a portion of the Work. The term “Subcontractor” does not include those who supply materials or equipment only.
1.49 SUPERINTENDENT

The executive representative of the Contractor who shall be present at the work Site at all times during performance of the Work. Such Superintendent shall be fully authorized to receive and fulfill instructions from the Engineer and to execute and direct the Work on behalf of the Contractor.

1.50 UNIT PRICE

An amount stated in the Bid as a price per unit of measurement for materials or services as required by the Bid Documents.

1.51 WORK

The furnishing of all items of labor, material, equipment, transportation and incidentals required to fully complete the Project as described in the Contract Documents.

1.52 WORKING DAY

Every calendar day except Saturdays, Sundays and Legal Holidays.

* * END OF DIVISION 1 * *
GENERAL CONDITIONS

DIVISION 2 – PROPOSAL REQUIREMENTS AND CONDITIONS

2.01 COMPETENCY OF BIDDERS

A. At the time of the bid opening, the Bidders and their Subcontractors must be licensed in accordance with the provisions of Chapter 9 of Division III, commencing with Section 7000, of the Business and Professions Code of the State of California. Evidence of such licensing shall be presented to the Engineer upon request.

B. Prior to issuing the Bid Documents, the Engineer may require the Bidder to present satisfactory evidence that he has sufficient experience in the pertinent trade and that he is fully prepared with the necessary capitals, materials, equipment and skilled workers to fulfill the Contract should he receive the award.

C. No person or organization may bid on work of a kind for which they are not properly licensed, and any such bid received will be disregarded.

2.02 AVAILABILITY OF BID DOCUMENTS

The Drawings and Specifications may be examined at the office of the Department of Public Works and such other locations as are listed in the Notice to Contractors. The Bid Documents are available for purchase at the Department of Public Works. Unless stated otherwise in the Notice to Contractors, the purchase price is nonrefundable, and the Bid Documents need not be returned.

2.03 EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE OF THE WORK

A. The Bidders shall carefully examine the Site of the Work, and the Drawings and Specifications therefor. They shall investigate and satisfy themselves as to all conditions to be encountered; the character, quality and quantity of existing surface, subsurface, internal and external materials, appurtenances or obstacles; the work to be performed and materials and equipment to be furnished; and all requirements of the Contract. Except as expressly authorized in Division 4 herein the Contractor shall receive no additional compensation for any obstacles or impediments come upon during the course of the Work, nor for added costs due to difficulties caused by existing materials, appurtenances or obstructions structure, and he shall bear the entire responsibility therefor.

B. Where investigations of subsurface or internal, concealed conditions have been made by the County with respect to foundation or other structural design, or to structural modifications or additions, or to material or equipment application or installation, and that information is shown on the Drawings, said information represents only the statement by the County as to the character of the materials or appurtenances found during the investigations, and is shown only for the convenience of the Bidders. Such
investigations are made solely for the purpose of design, and the County assumes no responsibility whatever with respect to the sufficiency or accuracy thereof, or for their interpretation. There is no guarantee or warranty, expressed or implied, that the conditions indicated are representatives of those existing throughout the Work, or any part of it, or that unlooked-for developments may not occur. Making such information available to Bidders is not to be construed in any way as a waiver of the provisions of this Article concerning the Contractor’s responsibilities, and the Bidders must satisfy themselves through their own investigations as to the actual situation.

C. It is intended that the Drawings and Specifications imply everything necessary to properly perform the entire Work, although every item required may not be specifically mentioned or shown. Unless expressly stated otherwise, all work shall be complete in accordance with the obvious intent of the Specifications and design requirements.

D. Items listed as the extent of work in the Specifications are not necessarily all-inclusive. The Contractor shall be responsible for the complete Work.

E. Portions of the Specifications may be of the abbreviated, simplified type, and may include incomplete sentences.

1. Omissions of words or phrases such as “the Contractor shall”, “in conformity with”, “shall be”, “as noted on the Drawings”, “in accordance with the details” “a”, “the”, and “all” are intentional. Omitted words or phrases shall be supplied by inference.

2. Such terms as “approved”, “or equal”, “approved equal”, “as directed”, “as required”, “as provided”, “acceptable” and “satisfactory” shall be understood as being stated with reference to the County.

F. The data given in the Specifications and on the Drawings are as accurate as could be secured, but this accuracy cannot be guaranteed. The Drawings and Specifications are for the assistance and guidance of the Contractor, and exact locations, distances, levels, etc., will be governed by the job Site. The Contractor shall investigate the structural and finish conditions affecting the Work and shall arrange his procedures accordingly and provide such necessary alterations to the existing as may be required to meet such conditions.

2.04 DISCREPANCIES OR ERRORS IN THE BID DOCUMENTS

If omissions, discrepancies or apparent errors are found in the Drawings, Specifications or other Bid Documents prior to the date of the bid opening, the Bidder shall request clarification. If warranted, and if time permits, corrections or instructions will be given to all Bidders in the form of a written Addendum. Otherwise, in figuring the Work, Bidders shall be governed by Article 5.05, herein.
2.05 LIST OF SUBCONTRACTORS

A. Each Proposal shall have listed therein the name, address and category of work of each Subcontractor to whom the Bidder proposes to Subcontract a portion of the Work in an amount in excess of one-half of one percent (1/2%) of the total Base Bid, in accordance with Chapter 2, Division 5, Title 1 of the Government Code of the State of California.

B. In compliance with the provisions of Subsection 4104(b) of the aforementioned Division 5 of the Government Code, and under possible penalty of law as defined in Sections 4110 and 4111, therein, the Bidder shall list no more than one (1) Subcontractor for each portion of the Work.

2.06 AFFIRMATIVE ACTION

A. It is the policy of the County of Marin to take positive steps to maximize the utilization of minority and women’s business enterprises in all contract activity administered by the County.

B. The Bidder is encouraged to put forth good faith efforts to carry out this policy in the award of his Subcontracts to the fullest extent consistent with the efficient performance of the Contract. As used herein, the term “minority or women’s business enterprise” means a business at least fifty percent (50%) of which is owned by minority group members or women or, in the case of publicly owned businesses, at least fifty-one percent (51%) of the stock is owned by minority group members or women. For the purpose of this definition, minority group members are Black, Hispanic, Asian, Native American, Alaskan or Pacific Islander.

2.07 PROPOSAL FORM

A. All Proposals must be submitted on the form furnished in the Project Manual for that purpose, or a duplicate thereof. A letter of transmittal cannot be considered as part of the Bid.

B. Each Bid shall have noted thereon, in the space provided, the Bidder’s proposed price or prices to perform the Work, listed both in printing and in numerals, rounded to the nearest dollar, and shall be signed by the Bidder, who must give his address and other information specified on the form. The Bidder shall fill out all blanks in the Proposal form as therein required. In case of errors, written words will govern over numerals and unit prices will govern over extensions, unless it can be established to the satisfaction of the Board of Supervisors that an obviously incorrect entry has been made.

2.08 PROPOSAL GUARANTY

A. All Bids shall be accompanied by a Proposal Guaranty of at least ten percent (10%) of the total amount bid. In event that Alternate Bids are required, the Proposal Guaranty shall be for ten percent (10%) of the Base Bid. Guaranties shall be in the
form of a Certified or Cashiers Check, a Bank or Postal Money Order, or a Bid Bond, and shall be made payable to the County of Marin.

B. All Proposal Guaranties shall be retained by the Board of Supervisors for a period of thirty (30) calendar days after the award or until the successful Bidder executes the Contract and furnishes Contract Bonds, whichever occurs first. The Proposal Guaranties of the unsuccessful Bidders will then be returned upon request.

C. Failure or refusal of the successful Bidder to execute and return the Contract, or to file acceptable Bond, as herein required, within the time allotted, may be cause for the annulment of the award, and the Board of Supervisors may, at their discretion, award the Contract to the next lowest responsible Bidder. The Proposal Guaranty of the Bidder failing or refusing to execute the Contract shall be forfeited to the County and shall be applied against the County’s damages resulting from such failure.

2.09 WITHDRAWAL OF PROPOSALS

Any Proposal may be withdrawn at any time prior to, but not after, the time fixed in the public notice for the opening of Bids. The withdrawal of a Bid shall not prejudice the right of a Bidder to file a new Proposal.

2.10 REJECTION OF IRREGULAR PROPOSALS

A. Not withstanding the right of the Board of Supervisors to waive irregularities, Proposals may be rejected if they show any alterations of form, if they contain additions not called for, if they are conditional or incomplete, or if they diverge from the requirements or conditions in any matter.

B. When a Proposal is signed by an agent other than an officer of the firm, a power of attorney or written authorization must be furnished to the Engineer no later than the hour of the bid opening; otherwise, the Bid may be rejected as irregular and unauthorized.

C. Proposals in which the prices are unbalanced may be rejected.

2.11 DISQUALIFICATION OF BIDDERS

A. More than one Proposal from an individual or an organization, under the same or different name, will not be considered, and all such Proposals will be rejected.

B. Reasonable grounds for believing that any Bidder is involved in the Proposal of any other Bidder for the work contemplated will result in the rejection of all such Proposals. If there is reason for believing that collusion exists among the Bidders, none of the participants in such collusion will again be considered or permitted to bid on this or any future County Projects.
C. A party who has quoted prices on materials or Subcontract work to one Bidder is not hereby disqualified for quoting such prices to other Bidders, or for submitting a Bid directly for the materials or work.

D. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 of the Labor Code at the time the contract is awarded.

2.12 RELIEF OF BIDDERS

Any Bidder claiming a bidding mistake and requesting relief therefrom shall follow and be subject to the provisions and procedures set forth in Part 1, Division 2, Chapter 5, “Relief of Bidders”, Section 5100, et seq., of the California Public Contract Code, which requires, in part, that the Bidder must:

1. Establish to the satisfaction of the County that an honest mistake was made.

2. Furnish the County written notice within five (5) Working Days of the bid opening specifying in detail how the mistake occurred.

3. Show that the mistake was made in filling out the Bid and not due to error in judgement or to carelessness in inspecting the Site of the Work, or in reading the Drawings or Specifications.

* * END OF DIVISION 2 * *
GENERAL CONDITIONS

DIVISION 3 – AWARD AND EXECUTION OF THE CONTRACT

3.01 CONSIDERATION OF BIDS

The Bids will be opened publicly on the date, at the time, and in the manner set forth in the Notice to Contractors. The County reserves the right to reject any or all Bids or waive any irregularities therein if, in the judgement of the Board of Supervisors, the best interest of the County will be promoted thereby.

3.02 AWARD OF CONTRACT

The award of the Contract, if it be awarded, will be to the lowest responsible Bidder whose Proposal complies with all the requirements prescribed. The award, if made, will be made within thirty (30) calendar days after the opening of the Proposals. No Bid may be withdrawn during this period.

3.03 RETURN OF PROPOSAL GUARANTIES

The County will hold all Proposal Guaranties until the Contract has been signed, after which they will be returned to the respective Bidders whose Proposals they accompany. If the Bids are rejected, the Proposal Guaranties will be returned after the date of rejection.

3.04 CONTRACT BONDS

A. A Faithful Performance Bond and a Labor and Materials Payment Bond, each for one hundred percent (100%) of the Contract amount, executed on forms provided in the Project Manual, or approved equivalents, shall be furnished by the successful Bidder at the time of signing the formal Agreement. Such Bonds shall be furnished at no additional expense to the County and shall be executed by a responsible surety acceptable to the County.

B. Alterations, extensions of time, extra or additional work, or any other changes authorized by these General Conditions or any other part of the Contract may be made without securing the consent of the surety on the Contract Bonds.

3.05 INDEMNITY AND INSURANCE REQUIREMENTS

A. Definition

1. For the purposes of this Article, and this Article only, “County” shall mean both the County of Marin and the public entity awarding the Contract by action of the Board of Supervisors sitting as the governing body of such public entity.
B. Indemnity

1. To the maximum extent allowed by law and consistent with Civil Code Section 2782, Contractor shall effectively defend, indemnify, and hold harmless County, its Architect, officers, agents, and employees, from any liability as a consequence of any willful act or negligent act or omission by the Contractor, any of the Contractor's employees or agents, or any subcontractor, and shall be responsible for any and all damage, injury, or death to persons, or damage to property. Contractor shall indemnify, defend and hold harmless County, its officers, agents, and employees from any and all claims, suits, actions, costs, and liability ensuing in connection with the performance of the contract, or failure to protect the safety of workers or the general public. The duty to defend shall include, but is not limited to, the payment of court costs, expert witness fees, and attorney’s fees (whether or not handled “in-house” by the County) and shall further include attorney’s fees for separate counsel if there exists an actual or potential conflict between County and Contractor.

Consistent with Civil Code Section 2782, this provision does not impose upon Contractor liability for damages for death or bodily injury to persons, injury to property, or any other loss, damage or expense arising from the sole negligence, or willful misconduct of the County or the County’s agents, servants, or independent contractors who are directly responsible to the County, or for defects in design furnished by those persons. In addition, consistent with Civil Code Section 2782, this provision neither imposes upon Contractor, nor relieves County of, liability arising from the active negligence of the County.

2. In those instances where the County has obtained “Rights of Entry” from private property owners upon whose property it will be necessary for the Contractor to enter to perform the Work to be done under the Contract, the Contractor shall indemnify such property owners in the same manner as the County is indemnified.

C. Insurance Requirements

1. The Contractor shall procure and maintain, for the duration of the Contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, his agents, representatives, employees or Subcontractors. The cost of such insurance shall be included in the Contractor’s bid.

2. Said policies shall be in effect until final acceptance of the Work by the County. If the Contractor fails to maintain the insurance required herein, the County may secure such insurance and deduct the cost thereof from any funds owing to the Contractor.

D. Minimum Scope of Insurance

The Contractor shall procure insurance covering general liability, automobile liability and workers’ compensation. The coverage shall be at least as broad as:
1. (If primary) Insurance Services Office (ISO) Commercial Liability Insurance “occurrence” form CG 00 01 or its equivalent.

2. (If excess) at least as broad as the primary insurance referenced in the preceding section.

3. Insurance Services Office form no. CA 0001 (Ed. 1/78) covering Automobile Liability, code 1, “any auto”, and endorsement CA 0029.

4. Workers’ Compensation insurance as required by the Labor Code of the State of California, and Employer’s Liability insurance.

E. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability Coverage

   a. The County of Marin, or the public entity awarding the Contract if other than the County, the Architect, if any, and their officials, employees and volunteers are to be covered as insureds as respects: liabilities arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the County, its officials, employees or volunteers.

   b. All private property owners granting “Rights of Entry” for construction of the Work shall be covered as insureds under the same coverage as provided the County as respects their ownership of the property and the work to be done thereon.

   c. The Contractor’s insurance coverage shall be primary insurance as respects the County, its officials, employees and volunteers and any other insureds under the Contract. Any insurance or self-insurance maintained by the County, its officials, employees and volunteers or other insureds shall be in excess of the Contractor’s insurance and shall not contribute with it.

   d. Any failure to comply with the reporting provisions of the policies shall not affect the coverage provided to the County, its officials, employees and volunteers or other insureds under the Contract.

   e. The coverage shall state that the Contractor’s insurance shall apply separately to each insured against whom claims are made or suit is brought, except with respect to the limits of the insurer’s liability.
2. Workers’ Compensation and Employer’s Liability Coverage

Contractor shall advise County in writing if any insurance coverage or policy is suspended, voided, canceled by either party, or reduced in coverage or in limits.

F. Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best’s rating of no less than A VII. Insurers not licensed in the State of California should have a current A.M. Best’s rating of no less than A X.

G. Minimum Limits of Insurance

The Contractor shall maintain insurance limits of no less than:

1. Commercial General Liability: $2,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. If the policy has an annual aggregate, the limit of the annual aggregate must be at least twice the occurrence limit. The County of Marin shall be named as an additional insured on the commercial general liability policy and the Certificate of Insurance shall include an additional endorsement page.

2. Automobile Liability: $2,000,000 combined single limit per accident for bodily injury and property damage.

3. Workers’ Compensation and Employer’s Liability: Workers’ Compensation limits as required by the Labor Code of the State of California, and Employer’s Liability limits as $1,000,000 per accident.

H. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the County. At the option of the County, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the County, its officials and employees; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

I. Verification of Coverage

The Contractor shall furnish the County with certificates of insurance and with original endorsements affecting the coverage required by this Article. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on an ACORD 25 (2009/09 or later date) or a form acceptable to County before work commences. The County reserves the right to require complete, certified copies of all required insurance policies at any time.
J. Subcontractors

Contractor shall require all its subcontractors to name Contractor and County of Marin as additional insureds under its general liability policy and Contractor shall require all its subcontractors to furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein with not less than the minimum limits as required by the California Department of Consumer Affairs, Contractors State License Board. Contractor shall be responsible for collecting and verifying the evidence of insurance from its subcontractors.

3.06 EXECUTION OF CONTRACT

A. All required copies of the Agreement shall be signed by the successful Bidder and returned to the County, together with the Contract Bonds and insurance policies, within ten (10) Working Days from the date that notice of award of the Contract is transmitted to him.

B. After verification by the County that the insurance and bonding requirements have been met, a fully executed copy of the Agreement shall be returned to the successful Bidder and shall constitute his Contract for the Work.

3.07 FAILURE TO EXECUTE CONTRACT

A. If the successful Bidder fails or refuses to execute the Contract within ten (10) Working Days from the date of notification of contract award, or within the time as may be extended due to delays beyond the Bidder’s control, said failure or refusal shall be just cause for the annulment of the award and the forfeiture of all or part of the Bidder’s Security, as determined, and the County may award the Contract to the next lowest Bidder or reject all Proposals and rebid the Project.

B. The Bidder who has failed or refused to execute the contract shall be liable to the County for the sum, not exceeding the amount of his Proposal Guaranty, by which the amount of the Contract for the Project, executed by and between the County and some third party, exceeds the amount bid by the original successful Bidder, including the County’s direct costs for rebidding the Project, if applicable. Such portion of said Proposal Guaranty as equals said sum or sums shall be deemed to be Liquidated Damages and shall be forfeited to the County.

* * END OF DIVISION 3 * *
GENERAL CONDITIONS

DIVISION 4 – SCOPE OF WORK

4.01 INTENT OF CONTRACT

A. The intent of the Contract is to prescribe and provide for a complete Work or improvement which the Contractor shall undertake and accomplish in full compliance with the Drawings, Specifications and other Contract Documents. The Contractor shall perform all items of work encompassed and stipulated in the Drawings and Specifications or reasonably inferable therefrom as necessary to produce the intended results. It is further intended that the Contractor shall perform all miscellaneous work required to make existing, adjacent or effected developments, improvements and construction conform to the new work.

B. Unless otherwise provided in the Specifications, the Contractor shall furnish all materials, implements, machinery, equipment, tools, supplies, transportation and labor necessary for the full prosecution and completion of the Project.

C. All work shown and described in the Drawings and Specifications will be let under one Contract unless otherwise set forth in the Notice to Contractors or the Proposal form(s).

4.02 PROCEDURAL ALTERATIONS

A. Should conditions become apparent during the course of the Project that make it impossible for the Contractor to comply strictly with the terms of the Contract he shall apply in writing to the Engineer for an alteration in the procedure. If such alteration is acceptable to the Engineer, and provided that it not be detrimental to the Work or entail additional cost, the Contractor shall be so notified in writing, whereupon the alteration may be made. When such alteration is not acceptable to the Engineer, the Contractor shall determine some other method which shall be acceptable.

B. Any such procedural alteration shall in no way modify the Contract, or any part thereof except that which is necessarily effected thereby.

4.03 CHANGES IN THE WORK

A. No additive or deductive change in the Work will be authorized except through a written, cost-itemized Change Order, signed by the Contractor and approved by the Board of Supervisors and/or the Director of The Department of Public Works as required, and no such change shall commence until such Change Order is approved.
B. Should the parties be unable to agree on the costs for the changes, or if itemization is impractical, the Engineer may instruct the Contractor to proceed by Force Account and he shall be paid therefor as provided hereinafter.

4.04 CHANGE ORDERS

A. The County may order changes, additions or deductions in the Work at any time during the course of the Project through standard written Change Orders.

B. The County and the Engineer must approve all Change Orders in writing. The Contractor shall bear the expense and responsibility for any changes not authorized in writing by the County and the Engineer, irrespective of any oral directions, understanding or suppositions.

C. Accepted Change Orders shall not invalidate the Contract or any provisions thereof. The Contractor shall, in all respects, execute all authorized changes under the original conditions of the Contract, excepting adjustments made on claims for payment or time.

D. Changes in the Work, when ordered and accepted, shall be paid for under the terms of the Contract, and such payments shall be made at the lump sum or unit price agreed upon by the Contractor and the County, or by Force Account.

4.05 UNAUTHORIZED WORK

Work done in the absence or without the knowledge of the Engineer, or any extra work done without written authority, will be considered as unauthorized and at the expense of the Contractor and will not be measured or paid for by the County.

4.06 RESPONSIBILITY FOR EXISTING UTILITIES

The Contractor shall be responsible, at his own cost, for any and all work, expense or special precautions caused or required by the existence of proximity of utilities encountered in performing the Work, including, without limitation thereon, repair of any and all damage, and all hand or exploratory excavation required. The Contractor is cautioned that such utilities may include communication or electrical cables which may be high voltage, and the ducts enclosing such cables, as well as gas and water piping. When working or excavating in the vicinity thereof, the special precautions he shall observe, shall include exposing all such cables, wiring, ducts, conduit and piping by careful hand excavation or cutting so as not to damage them or cause personal injury. Suitable warning signs, barricades and safety devices shall be erected as necessary.

4.07 EXTRA WORK DUE TO UNFORESEEN OBSTACLES

A. If, during the course of the Work, the Contractor encounters obstacles or installations which are not shown or indicated on the Drawings or in the Specifications, or which are found in a location substantially different from that shown or indicated, and such obstacles are not reasonably apparent from visual examination, then he shall promptly
notify the Engineer thereof in writing. Where necessary, the Engineer shall issue a
written order to the Contractor to make such adjustment, rearrangement, repair,
removal, alteration or special handling of such obstacle, including repair of any
damage, as he deems appropriate.

B. The Contractor shall perform the work described in such written order.
Compensation therefor will be made in accordance with the provisions hereof relating
to changes in the Work. Except for the items of cost specified in such provisions, the
Contractor shall receive no compensation for any other cost, damage or delay to him
due to the presence of such obstacle. If the Contractor fails to give the notice
specified above and thereafter acts without instructions, then he shall be liable for any
or all damage to such installations or other work of the Contract which arises from his
operations subsequent to discovery thereof, and he shall repair and make good such
damage at his own cost.

C. If the Contract requires excavation or other work to a stated limit of elevation beneath
the surface, and if, during the course of the Work, the Engineer orders a change of
depth or dimension of such subsurface work due to discovery of unsuitable bearing
material, or for any other cause, then adjustment in the Contract price for such change
will be made in accordance with the provisions hereof relating to changes in the
Work. Except for the items of cost specified herein, the Contractor shall receive no
compensation for any other cost, damage or delay to him due to the presence of such
unsuitable bearing material or other obstruction.

** END OF DIVISION 4 **
GENERAL CONDITIONS

DIVISION 5 – CONTROL OF WORK

5.01 AUTHORITY OF THE ENGINEER

The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed, and as to the manner of performance and rate of progress of the Work; all questions which may arise as to the interpretation of the Drawings and Specifications; all questions as to the acceptable fulfillment of the Contract on the part of the Contractor; and all questions as to compensation. His decision shall be final and he shall have authority to enforce and implement such decisions and orders which the Contractor fails to carry out promptly.

5.02 AUTHORITY AND DUTIES OF INSPECTORS

A. Duly authorized Inspectors, who shall perform their duties under the direction of the Engineer, may be assigned to the Project or each part thereof. The presence of an Inspector shall in no way lessen the responsibility of the Contractor. In case any dispute arises between the Contractor and an Inspector as to materials furnished or the manner of performing work, the Inspector shall have authority to reject materials or suspend the work until the questions at issue can be referred to, and decided by, the Engineer. The Inspector is not authorized to revoke, alter, enlarge, relax or release any requirement of these General Conditions, nor to approve or accept any portion of the Work, nor to issue instructions contrary to the Drawings and Specifications.

B. Exceptions to the foregoing apply to:

1. Any Inspector from the Building Inspection Division of the Community Development Agency, or from a local municipality having jurisdiction, who shall have full authority to make and enforce decisions regarding compliance with construction codes.

2. The Marin County Fire Marshal, or the fire marshal from the local municipality having jurisdiction, who shall have full authority to make and enforce decisions regarding compliance with fire safety requirements.

3. Any Inspector from the County Division of Environmental Health, who shall have full authority to make and enforce decisions regarding health and sanitation requirements, where applicable.

4. The Architect, if any, or his representatives, who shall have full authority commensurate with that of the Engineer.
5.03 SUPERINTENDENCE

The Contractor shall, at all times, have a competent and experienced Superintendent as his agent on the Project. The Superintendent shall be in charge of the Work, shall be capable of reading and thoroughly understanding the Drawings and Specifications, and shall have full authority to execute the orders or directions of the Engineer without delay and to promptly furnish such labor, materials, equipment, tools and incidentals as may be required. Such Superintendent shall be provided irrespective of the amount of work sublet.

5.04 WORKMANSHIP

A. The Contractor shall provide all skilled workers necessary to properly fabricate, transport, erect, apply and install the Work to the highest trade standards.

B. The Contractor shall be responsible for verifying all dimensions and elevations at the Site.

   1. The Contractor shall check all dimensions and grades as the layout progresses, between the various Drawings and trades, and as indicated by the Specifications. He shall call any conflicts to the attention of the Engineer prior to proceeding with construction.

   2. The Contractor shall coordinate, schedule and sequence the operations so as to permit suitable construction and protect existing or new improvements from any damage.

C. The Contractor shall support plumb, rigid and true to line all work furnished. He shall study thoroughly all available drawings and catalog data to determine how the material is to be supported, mounted or suspended, and shall provide all bolts, inserts, structural shapes, brackets and accessories necessary for proper support.

D. All attachments, connections, fastenings and inserts of any nature shall be properly and permanently secured in conformance with the best practice, and the Contractor is responsible for providing them according to these conditions. The Drawings show only special conditions to assist the Contractor; they do not illustrate every such detail.

E. Finished work shall be firm, well anchored, in true alignment, plumb, level, of smooth, clean appearance, without waves, distortions, holes, marks, cracks, stains or discoloration. Jointings shall be close fitting, neat and well scribed. Finished work shall have no exposed unsightly anchors or fastening, and shall not present hazardous, unsafe or unfinished protrusions, offsets, burrs, raw edges or sharp corners. All work shall have provisions for expansion, contraction and shrinkage as necessary to prevent cracks, buckling and warping.

F. No work defective in construction or quality, or deficient in any requirement of the Drawings and Specifications will be acceptable as a consequence of the County’s
failure to discover or to point out such defects or deficiencies during construction; nor will the presence of Inspectors on the Work relieve the Contractor from responsibility for securing the quality and progress thereof as required by the Contract.

G. The intent of the Contract is to achieve a finished, workmanlike job, complete in all respects. Anything reasonably implied or intended to accomplish this end shall be furnished and installed.

5.05 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

A. The Drawings, Specifications and all authorized supplements thereto are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative and to describe and provide for a complete Work.

B. Should it appear that the work to be done, or any of the matters relative thereto, is not sufficiently detailed or explained in the Drawings or Specifications, the Contractor shall apply to the Engineer for such further explanations as he deems necessary, and shall conform to the same as part of the Contract so far as may be consistent with the original documents. Any doubt or question arising respecting the true meaning and intent of the Drawings or Specifications shall be referred to the Engineer, whose decision thereon shall be final.

C. In the event of any discrepancy between a drawing and the figures written thereon, the figures shall be taken as correct.

D. The Contractor shall perform any part of the Work which is not mentioned in the Specifications, but is shown on the Drawings, or any part not shown on the Drawings but described in the Specifications.

E. The Contractor will be supplied with all necessary copies of the Drawings and Specifications, and shall have available one (1) updated set on the Site at all times in order to facilitate the progress of the Work.

5.06 CONFORMANCE WITH DRAWINGS

Finished surfaces shall conform with the plans, elevations, sections, details and dimensions shown on the approved Drawings. Deviations from the Drawings, if required by the exigencies of construction will, in all cases, be determined by the Engineer and authorized in writing.

5.07 DRAWING ALTERATIONS

All authorized alterations affecting the requirements and information given on the approved Drawings shall be in writing. No changes shall be made in any plan or drawing after the Engineer has approved the same, except by his direction. Where, at any time, reference is made to the “Drawings”, such shall be deemed the approved Drawings as modified by all authorizes alterations then in effect.
5.08 ALTERNATE CONNECTIONS

Where material requiring different arrangements or connections from that shown is approved, it shall be the responsibility of the Contractor to install the material properly and in harmony with the intent of the Drawings and Specifications. The Contractor shall submit drawings showing the proposed installation for approval prior to fabrication.

5.09 MANUFACTURER’S INSTRUCTIONS

Where the Specifications require that such items as materials, products or processes are to be installed or applied in accordance with the manufacturer’s instructions, directions or specifications, or words to this effect, it shall be construed to mean that said application or installation shall be in strict accordance with printed instructions furnished by the manufacturer of the item concerned for use under conditions similar to those at the Job Site.

5.10 SUBMITTALS

A. Unless noted otherwise in the Specifications, the Contractor shall submit to the Engineer five (5) sets of Shop Drawings and other descriptive data for all work for which submittals are specifically required, three (3) marked sets of which will be returned to the Contractor. All submittals shall be fully identified as to project, agency, location, work order and contract numbers, and the Contractor’s business name.

B. All submittals shall be made within a period which will cause no delay in the Work. The Contractor shall allow reasonable time for review by the Engineer.

C. The submittals shall be clear and legible prints which shall indicate completely the materials, articles, equipment and work to be done; the actual details of all manufactured or fabricated items; the proper relation to adjoining and kindred work; and shall amplify design details of mechanical, electrical and other equipment in logical relation to physical spaces in the structure.

D. Submittals are defined as fabrication, erection, roughing-in and setting drawings; wiring and control diagrams; schedules and lists of materials and equipment; descriptive literature, catalogs, brochures, pamphlets and cuts; performance and test data; part lists, maintenance and operating instructions; and other descriptive data pertaining to materials, equipment and methods of construction as required to clearly delineate the Work. The Engineer may require the Contractor to provide additional specific data or information where particular items of work are not fully or clearly described in the submittals.

E. The Engineer will review all submittals for conformity with design requirements only, noting thereon any necessary corrections. Notwithstanding approval thereof, the Contractor shall remain responsible for his own errors contained in such submittals and for full compliance with all requirements of the Contract, including,
without limitation, the accuracy of quantities and dimensions, the quality of the Work, conformance to actual conditions in the Work, and coordination and fit of his work with all other work. The Engineer’s approval of the submittals does not constitute approval of any detail thereof which is in conflict with the Drawings or Specifications unless there is specific written authorization therefor.

F. When specifically directed by the Engineer, the Contractor shall resubmit such Shop Drawings and descriptive data as may be required, and shall continue such directed resubmission until approval is obtained.

5.11 COORDINATION AND COOPERATION

A. Where the Work is being performed in an occupied facility, close coordination and cooperation between the Owner and the Contractor will be of the greatest importance so as to keep interference the normal routine to an absolute minimum. It shall be the Contractor’s responsibility to obtain prior approval from the Engineer for the scheduling of any work that will result in unavoidable interference so that arrangements can be made to maintain the necessary level of operations.

B. The Contractor shall be responsible for the scheduling of all work.

C. The Contractor and his Subcontractors shall coordinate their work and shall cooperate so as to facilitate the general progress thereof. Each trade shall afford the other trades every reasonable opportunity for the installation of their work and the storage of their materials and equipment.

D. The Contractor and his Subcontractors shall carefully check their respective work and reach clear understanding as to the items furnished by each and their sequence of placement.

5.12 ACCIDENT PREVENTION

Precautions shall be exercised at all times for the protection of persons (including the Contractor’s employees) and property. The Contractor shall install adequate safety guards and protective devices for any and all equipment and machinery, whether used in the Work or installed as a part thereof. All care shall be employed to insure that the work proceeds under the highest standards of safety and prudence, and in compliance with all applicable laws relating to safety precautions.

5.13 FIRE CONTROL

A. No open fires will be permitted on the Site.

B. Approved and sufficient fire extinguishing equipment must be provided at each location of the Work whenever torch-cutting, welding or other fire hazardous operations are in progress.
5.14 CLEANLINESS

A. At the conclusion of each day’s work, all loose material and equipment shall be stored as hereinafter provided, and all debris shall be cleaned up and removed from the Site.

B. Where the Work is being performed in an occupied facility, the Contractor shall exercise strict cleanliness control whenever engaged in saw-cutting operations, gypsum board topping and sanding, plastering or similar dust or “mud” producing work. Excessively drifting dust or the tracking of dust or “mud” within the building will not be permitted.

C. The building and grounds shall be kept clean at all times. After completion of the Contract and before receiving the final payment, the Contractor shall have all parts of the Site cleaned wherever such cleaning is needed as a result of work performed on the Project.

D. Upon final acceptance of the Work, all tools, containers and equipment, and all rubbish and debris resulting therefrom, shall have been removed from the premises. All defects and blemishes shall have been touched up and all finger marks removed. The entire area where the Work was performed shall be left perfectly clean with respect thereto.

5.15 NOISE CONTROL

A. All internal combustion engines employed on the Project shall be equipped with approved mufflers.

B. Where the Work is being performed in an occupied facility, the Contractor’s employees shall conduct themselves in a quiet and considerate manner. No radios or boisterous activity will be permitted, and all unnecessary noise shall be kept to a minimum.

5.16 UTILITIES

Water and electric power may be taken without charge from building systems within the limitations of existing facilities. Connections and distribution shall be by the Contractor.

5.17 SANITARY CONVENIENCES

A. Necessary sanitary facilities for the use of workers on the Project, properly secluded from public observation and in compliance with health ordinances and laws, shall be constructed and maintained in an approved manner by the Contractor, and their use shall be strictly enforced.

B. Where the Work is being performed in an occupied facility, the public toilets or, where authorized, the Contractor’s personnel therein may use the staff toilets. All
restrooms so used shall be maintained in a clean and sanitary condition with respect to such use.

5.18 OBSTRUCTIONS

A. No material or other obstruction shall be placed within fifteen (15) feet of fire hydrants which must be at all times readily accessible to the Fire Department.

B. The Contractor shall observe all ordinances and laws in relation to the obstruction of streets, sidewalks and driveways, keeping open passageways and protecting public property.

C. Where the completion of the Work requires their removal, the Contractor shall remove and dispose of all structures, debris or other obstructions encountered making the improvement.

5.19 PRESERVATION OF MONUMENTS

When engaged in site work, the Contractor shall carefully preserve all bench marks, reference points and stakes. In case of willful or careless destruction, he will be charged with the entire cost of replacing them, and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance. Monuments which have to be removed shall not be disturbed until authorized by the Engineer.

5.20 PATCHING AND REPAIRS

A. Repaired areas, and areas adjacent that are damaged due to repairs (demolition and/or construction), shall have their finishes extended so as to restore their surfaces.

B. The portions of the Site upon which work is not being done under the Contract shall be accepted by the Contractor in their existing condition, and any damage or breakage caused by the furnishing, transporting or installing of materials or equipment, or by alterations, shall be repaired or replaced by the Contractor without any expense to the County.

5.21 INSPECTION

A. The Contractor shall, at all times, permit the Engineer and his authorized agents to visit and inspect the Work or any part thereof. He shall maintain proper facilities and provide safe access for such inspection to all parts of the Work, and to the shops where the Work is in preparation.

B. Where the Contract requires work to be tested by the Contractor, it shall not be covered up until inspected and approved by the County. The Contractor shall be solely responsible for notifying the Engineer where and when such work is in readiness for inspection and testing.
C. Whenever the Contractor intends to perform work on Saturday, Sunday or a legal holiday, he shall give notice to the Engineer of such intention 24 hours prior to performing such work, or such longer period as may be specified, so that the County may make the necessary arrangements.

1. Reference is made to Article 7.09, herein, for additional stipulations with regard to out-of-hours work.

5.22 DEFECTIVE OR UNAUTHORIZED WORK OR MATERIALS

A. All work or materials which are defective in construction or deficient in any of the requirements of the Specifications shall, upon demand by the County, be remedied, or removed and replaced by the Contractor in an acceptable manner, and no compensation will be allowed for such correction.

B. Upon the failure of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this Article, the Engineer shall have the authority to cause defective work or materials to be remedied, or removed and replaced, and unauthorized work to be removed, and to deduct the costs thereof from any monies due or to become due the Contractor.

5.23 DISPUTED CLAIMS

A. In any case where the Contractor deems extra compensation is due him for work or materials not clearly covered in the Contract, or not ordered by the Engineer as extra work, he shall notify the Engineer, in writing, of his intention to make claim for such extra compensation before he begins the work on which he bases the claim. If such notification is not given, or if such notice is given but the Engineer is not afforded proper facilities by the Contractor for keeping strict account of the actual cost of said work, then the Contractor hereby waives all claims for such extra compensation.

B. Such notice by the Contractor, and/or the fact that the Engineer has kept account of the cost as aforesaid, shall not, in any way, be construed as an admission of the validity of the claim.

5.24 FINAL INSPECTION

Whenever the work provided and contemplated by the Contract shall have been satisfactorily completed and the final cleaning up performed, and the Contractor so notifies him, the Engineer shall make the final inspection.

* * END OF DIVISION 5 * *
GENERAL CONDITIONS

DIVISION 6 – CONTROL OF MATERIALS

6.01 QUALITY OF MATERIALS

A. Before the Contract is awarded, each Bidder may be required to furnish a complete statement of the origin, composition and manufacturer of any or all material to be used in the construction of the Work, together with samples, which samples may be subjected to tests, provided for herein, to determine their quality and fitness for the Work.

B. All materials shall be new, shall be the manufacturer’s latest products and shall be first quality in keeping with the highest trade standards.

C. When the Contract Documents indicate or require that materials, articles or equipment are to be furnished, but the quality or kind thereof is not particularly specified, shown or indicated, the Contractor shall furnish materials, articles or equipment at least equal to the class or quality of similar materials, articles or equipment which are specified, shown or indicated. No claim for additional compensation based on the County’s failure to specify or indicate the class, type or quality of materials, articles or equipment will be recognized in any event, unless the Contractor makes a clear showing that he could not determine the class, type or quality of materials, articles and equipment to be furnished from the Drawings or Specifications or by application of this Subarticle.

D. Approved products and materials shall be delivered to the Job Site in their original containers, with seals unbroken and labels intact.

E. All materials shall comply with the standards of:
   1. American National Standards Institute (ANSI)

6.02 SPECIFIED MATERIALS

A. For convenience in designation on the Drawings or in the Specifications, a brand or trade name or the name of a manufacturer, together with a catalog number or other identifying information may describe certain materials, articles or equipment. Unless otherwise noted, such designation is for descriptive purposes only and does not mean that a particular product has any preference, nor that an approved alternative product may not be used. All such designations shall be deemed to be followed by the words, “or approved equal”.

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B. Where materials, articles or equipment are specified only by type, style and rating, the Bidder may choose any manufacturer whose products meet or exceed the specifications.

C. In certain instances materials, articles or equipment must exactly match those already existing in place. In such circumstances the specified items required will be clearly designated and no substitutions will be permitted.

D. When descriptive catalog designations, including the manufacturer’s name, product brand name or model number are referred to in the Bid Documents, such designations shall be considered as being those found in industry publications of current issue at date of first invitation to bid, unless noted otherwise.

E. When standards of the Federal or State governments, trade societies or trade associations are referred to in the Bid Documents by specific date of issue, they shall be considered a part of this Contract. When such references do not bear a date of issue, the current published edition at the date of first invitation to bid shall be considered as part of this Contract.

6.03 ALTERNATIVE MATERIALS

A. The use of alternative or substitute materials, articles or equipment which are of equal or better quality and of the required characteristics for the purposes intended, if not otherwise prohibited, will be permitted if approved by the Engineer, and provided the Contractor requests such approval in writing in accordance with the following requirements:

1. All such requests for approval, if not made prior to the bid opening, as required, shall be made within thirty (30) calendar days of the date of the Notice of Award, if authorized, including any required resubmittals thereof following disapproval. In exceptional cases, where the best interests of the County so require, the Engineer may give written consent to submittal or resubmittal of an alternative product for approval after expiration of the prescribed time limit.

2. All requests for use of alternative materials, articles or equipment shall be accompanied by complete information and descriptive data necessary to show the quality of the alternative items. The Engineer shall be the sole judge as to the comparative quality and suitability of the alternative products, and his decision thereon shall be final. The burden of proof as to the comparative quality and suitability of the alternative products for approval after expiration of the prescribed time limit.

B. Where material is specified by capacity or performance, then the burden of proof shall be on the Contractor to show that any particular equipment, articles or materials meet the minimum capacities or the performance requirements shown on the Drawings or as specified. The Contractor shall furnish at his own expense all
information necessary to determine whether such minimum capacities or performance requirements will be met.

C. The installation of any approved alternative materials, articles or equipment is the Contractor’s responsibility. Any mechanical, electrical, structural or other changes required for the proper installation and fit of the alternative materials, articles or equipment shall be made without additional cost to the County, and shall be subject to approval by the Engineer.

6.04 SAMPLES AND TESTS

A. At the option of the Engineer, the source of supply of each of the materials shall be approved by him before delivery is started and before such material is used in the Work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producers of all materials to be used in the Work, for testing or examination, if requested by the Engineer.

B. All tests of materials furnished by the Contractor shall be made in accordance with commonly recognized standards as set forth in the Specifications, and such other special methods and tests as may be prescribed.

C. The Contractor shall furnish such samples of materials as are requested by the Engineer, without charge. No material shall be used until it has been approved by the Engineer. Samples will be secured and tested by a laboratory whenever necessary to determine the quality of the material.

D. If authorized by the Engineer, the approved material samples may be used in the Work

6.05 DEFECTIVE MATERIALS

All materials not conforming to the requirements of the Specifications shall be considered as defective, and shall be rejected. They shall be removed immediately from the Site, at the sole expense of the Contractor, unless otherwise permitted by the Engineer. No rejected material, the defects of which have subsequently been corrected, shall be used until approved in writing by the Engineer.

6.06 STORAGE OF MATERIALS

A. All materials, articles and equipment shall be stored so as to insure the preservation of their quality and fitness for the Work, and shall be located so as to facilitate their prompt inspection.

B. Where the Work is being performed in an occupied facility, all materials and equipment left on the premises overnight shall be stored in a location as assigned by the Engineer. The Contractor shall insure that materials so stored are adequately protected from moisture, soiling or damage of any kind whatsoever.
1. Because this on-site storage is for the Contractor’s convenience, and is furnished only as a courtesy by the County, the Contractor is cautioned to provide for the security of his stored property. The County will accept no responsibility for damage or loss due to vandalism, theft or any other cause.

6.07 PROTECTION OF MATERIALS

All material provided under this Contract shall be protected from damage during shipping, storage and installation. Any material that is damaged shall either be repaired to the satisfaction of the Engineer or be replaced with new, at no additional cost to the County.

Transportation Restriction: Any vehicles used in the transport of materials to and from the San Rafael Rock Quarry (SRRQ) for the performance of work on this contract shall be tarped. This shall include the tarping of empty vehicles on the way to pick up materials from SRRQ, as well as, the tarping of loaded vehicles delivering materials from SRRQ to the area of work. Tarps shall be held in place securely so as to minimize "flapping."

6.08 PROPERTY RIGHTS IN MATERIALS

Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the Work or the soil, or after payment has been made for fifty percent (50%) or more of the value of materials delivered to the Site, whether or not they have been so attached or affixed. All such materials shall become the property of the County of Marin upon being so attached or affixed, or upon payment of such fifty percent (50%) or more of their value.

6.09 INTEGRATED PEST MANAGEMENT (IPM)

A. Integrated Pest Management (IPM)

The Contractor shall be required to strictly adhere to the guidelines established in the County of Marin’s IPM Ordinance and Policy, approved by the Board of Supervisors on July 21, 2009. All pesticide applications, regardless of material used, must be approved by the IPM Coordinator prior to use at any facility covered by the contract. Material for weed eradication and pest control shall be only those listed in the County of Marin’s approved list and categories III and IV herbicides, non-corrosive, non-staining, and shall not leave a flammable residue. Pesticides shall be Environmental Protection Agency and California Department of Agriculture approved and used in strict accordance with manufacturer’s label, recommendations, Federal, State, and local laws. All requests for application must be submitted to the Engineer four calendar days prior to posting. Requests must include a map of the area, material requested to be used and dates of application requested. All applications must be approved by the Engineer in writing and applicators must have a signed Pest Control Recommendation before application. All information regarding approved applications will be posted to the County of Marin IPM website. Four (4) days prior to any pesticide application, any area to receive a pesticide application shall be posted to
notify the public except those areas specifically noted in the Ordinance. Chemical application must use least toxic methods and be used as the last resort and only with written approval. Failure to comply with the Marin County IPM Ordinance & Policy may result in fines of up to $200.00 per incident and/or contract termination. The IPM policy and Ordinance is available at the following website:
http://www.marincounty.org/depts/ag/ipm

B. List of Materials

Within thirty (30) days after award, the successful bidder shall furnish to the Engineer for approval a list of fertilizers, herbicides, insecticides, and other chemicals he proposes to use at each work site. He shall also furnish a sample label and a MSDS for each product. Contractor shall use only County approved materials.

C. Records

Contractor is required to maintain records of pest control activities. Contractor shall submit reports on a monthly basis to the Engineer if fertilizers, herbicides, insecticides, and other chemicals were used at the work site. Reports are to include the date, name of the pest, the site/location the work was done, name of technician performing the work and corrective action taken. If a pesticide was used, the product name, the amount applied and the area treated must also be reported.

* * END OF DIVISION 6 * *
GENERAL CONDITIONS

DIVISION 7 – LEGAL RELATIONS AND RESPONSIBILITIES

7.01 LAWS TO BE OBSERVED

A. The Contractor shall keep himself fully informed of all State and National laws and all County and municipal ordinances and regulations which, in any manner, affect those engaged or employed in the Work, or which in any way affect the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over all the same.

B. The Contractor shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with, all such laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the County and the Board of Supervisors, and the Engineer, and all of its and their officers and agents and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or Contract for the Work in relation to any law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same, in writing, to the Engineer.

7.02 PERMITS AND LICENSES

A. Prior to the commencement of the Project, the Contractor shall acquire all permits and licenses, pay all charges and fees, and, in the course of the Project, shall give all notices required, incidental to and necessary for the lawful prosecution of the Work.

B. The permits are obtained from the Building Inspection Division of the Community Development Agency and are issued free of charge. At the time of application, the Contractor must furnish proof of Workers’ Compensation Insurance.

7.03 INDEMNITY AND INSURANCE REQUIREMENTS

Reference is made to Article 3.05, herein.

7.04 CODES, STANDARDS AND REFERENCED SPECIFICATIONS

A. Various standards and codes may be incorporated in the Specifications by reference. In all such instances the reference shall mean the latest edition, including amendments or revisions in effect as of the date of the Specifications, unless a specific issue is identified otherwise. Such standards and codes, except as modified herein, shall have full force and effect as though printed in the Specifications.
B. In the event that referenced specifications or standards contain general requirements in conflict with these General Conditions or the scope of the work of individual Sections of the Specifications, the provisions of the Contract Documents shall govern.

C. Where conflict occurs between regulations, standard manufacturer’s specifications, codes, the Drawings and Specifications are not to construe to permit work not conforming to code.

D. Where not otherwise covered by specific direction, reference of instruction, the Work shall be governed by the best trade practices.

E. All work shall be performed in strict accord with the latest applicable codes and regulations, including, but not necessarily limited to:

   1. Cities and County of Marin, and California Fire Marshals.
   2. California Occupational Safety and Health Act (CAL/OSHA)
   3. Uniform Building Code (UBC)
   4. Safety Orders of the California State Division of Industrial Safety
   5. National Board of Fire Underwriters (NBFU)
   6. National Fire Protection Association (NFPA)
   7. Underwriters’ Laboratories, Inc. (UL)
   8. State of California Administrative Code, Title 24, Buildings Standards
   9. Cities and County of Marin Building Ordinances
   10. Applicable State and local building codes and ordinances governing the work under the Contract
   11. Nationally accepted codes and standards.

7.05 PREVAILING WAGES

A. Reference is made to Article 9 in the Notice to Contractors.

B. In compliance with the provisions of Section 1776 of the Labor Code of the state of California, as amended, the Contractor and each of his Subcontractors shall keep an accurate payroll record, 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 or worker employed by them in connection with the Project. Said records shall be available for inspection at all reasonable hours, and copies shall be made available to the employee or his
authorized representative, the State Division of Labor Standards Enforcement, the State Division of Apprenticeship Standards, and the County.

7.06 DISCRIMINATORY LABOR PRACTICES

A. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, nationality, sex, age or disabled condition. This shall include employment, demotion or transfer, recruitment or recruitment advertisement, layoff or termination, rates of pay or other compensation, and selection for training and apprenticeship. The Contractor shall post, in conspicuous places during the period of the Contract, and available to all applicants for employment, notices setting forth the provisions of this clause. The Contractor shall insert these provisions in all Subcontracts thereunder, except Subcontracts for standard commercial supplies or raw materials. The hiring of all labor for work shall be in accordance with all applicable directives of the Fair Employment Practices Commission (FEPC) of the State of California.

B. The Contractor shall forfeit, as a penalty, in addition to any other penalty provided by law, to the County, the sum of twenty-five Dollars ($25) for each calendar day, or portion thereof, during which he knowingly allows any conditions of discrimination to exist in connection with the Work, provided, however, that such penalty shall not be imposed without a full investigation and determination by the FEPC.

C. The Contractor shall cooperate fully with the County and with affected Unions to promote and insure the maximum employment of minorities, with particular emphasis on residents of Marin County, in all phases and at all levels of the Work. The Contractor shall encourage maximum utilization of apprenticeship and other on-the-job training programs to achieve this goal.

7.07 AFFIRMATIVE ACTION

Reference is made to Article 2.06, herein.

7.08 APPRENTICESHIP

A. Attention is directed to the provisions in Sections 1777.5, 1777.6 and 1777.7 of the Labor Code of the State of California concerning the employment of apprentices by the Contractor or any Subcontractor under him.

B. Section 1777.5, as amended, requires the Contractor or Subcontractor employing tradesmen in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the Site of the public work Project, and which administers the apprenticeship program in that trade, for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen that will be used in the performance of the Contract. The ratio of work performed by apprentices to journeymen in such cases shall not be less than one hour to five hours, except:
1. When unemployment in the area of coverage by the joint apprenticeship committee has exceeded an average of fifteen percent (15%) in the three (3) months prior to the request for certificate.

2. When the number of apprentices in training in the area exceeds a ratio of one to five.

3. When the trade can show that it is replacing at least 1/30th of its journeymen through apprenticeship training on an annual basis statewide or locally.

4. When assignment of an apprentice to the Work would create a condition which would jeopardize the apprentice’s life or the life, safety or property of fellow employees or the public at large.

5. If the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.

C. Any work performed by a journeyman in excess of eight (8) hours per day or forty (40) hours per week shall not be used to calculate the hourly ratio required herein.

D. The minimum ratio for the land surveyor classification shall be not less than one apprentice for each five journeymen.

E. Any ratio shall apply during any day or portion thereof when any journeyman, or the higher standard stipulated by the joint apprenticeship committee, is employed at the Job Site, and shall be computed on the basis of the hours worked by journeymen so employed, except for the land surveyor classification.

F. The Contractor shall employ apprentices for the number of hours computed as above before the end of the Contract. However, he shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the Site.

G. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one apprentice for each five journeymen.

H. The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if he employs registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the public works Site are making such contributions.

I. The Contractor and any Subcontractor under him shall strictly comply with the requirements of Sections 1777.5, 1777.6 and 1777.7 in the employment of apprentices.
J. The foregoing provisions shall not apply to contracts of general contractors, or to contracts of specialty contractors not bidding for work through a general or prime contractor, involving less than thirty thousand dollars ($30,000) or twenty (20) Working Days.

K. Information relative to apprenticeship standards, wage schedules and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

L. Reference is made to Article 7.05, herein.

7.09 NORMAL WORKING HOURS

A. Eight (8) hours of labor constitutes a legal day’s work. The Contractor shall forfeit, as a penalty to the County of Marin, twenty-five Dollars ($25) for each worker employed in the execution of the Contractor by him or any Subcontractor under him 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 the Labor Code, and in particular, Sections 1810 to 1815 thereof, inclusive, except that work performed by employees of the Contractor in excess of eight (8) hours per day and forty (40) hours during one week shall be permitted 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, as provided in said Section 1815.

B. Unless otherwise noted in the contract documents, the Contractor shall schedule his working hours to coincide with the working hours of the County Government, a normal five (5) day, forty (40) hour week, Monday through Friday, County holidays excepted. No work shall be performed on a County facility during other days nor during other hours without written approval of the Engineer.

C. If the Contractor, for his convenience, desires to perform work during other than normal working hours, or on other than normal Working Days, and after acquiring approval as provided above, he may be required to reimburse the County for any additional expense occasioned the County thereby, such as, but not limited to, utilities services and overtime pay for County Inspectors.

D. Reference is made to Article 9 in the Notice to Contractors.

7.10 LEGAL HOLIDAYS

Reference is made to Article 1.31, herein.

7.11 PROPERTY RIGHTS IN MATERIALS

Reference is made to Article 6.08, herein.
7.12 PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the Work, and agrees to indemnify and save harmless the County of Marin, the Board of Supervisors, the Engineer and their duly authorized representatives from all suits at law or actions of every nature for, or on account of, the use of any patented materials, equipment, devices or processes.

7.13 CONTRACTOR’S RESPONSIBILITY FOR WORK

A. Until the formal acceptance of the Work by the County, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part of the Work by the action of the elements or from any other cause whatsoever, whether arising from the execution or from the non execution of the Work, except as otherwise provided in Articles 6.08 and 7.17, herein.

B. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work before its completion and acceptance, and shall bear the expense thereof, except for such injuries or damages as are directly and proximately occasioned by acts of the Federal Government and the public enemy. In case of suspension of work from any cause whatever, the Contractor shall be responsible for the Work as above specified, and he shall also be responsible for all materials, and shall properly store them if required, and shall provide suitable drainage and erect temporary protective structures where necessary.

7.14 COOPERATION BETWEEN ORGANIZATIONS

A. The Contractor shall cooperate with all utility companies and with other contractors who may be performing work on behalf of the County, and with workers who may be employed by the County on any work in the vicinity of the Work to be done under this Contract. The Contractor shall so conduct his operations as to interfere to the least possible extent with the work of such contractors or workers. He shall promptly make good, at his own expense, any injury or damage that may be sustained by other contractors or employees of the County at his hands.

B. Any difference or conflict which may arise between the Contractor and other contractors, or between the Contractor and utility companies, or between the Contractor and workers of the County in regard to their work will be adjusted and determined by the Engineer.

C. If the work of the Contractor is delayed because of any acts or omissions of any other contractor or utility company, the contractor shall, on that account, have no claim against the County other than for an extension of time.
7.15 DAMAGE AND INJURY LIABILITY

A. The Contractor shall insure that all structures, surfaces, fixtures, glass, plants, etc., within the work area are adequately protected from damage during the course of the Project. He shall assume the cost of repairs for any and all damage for which he is responsible.

B. Neither the County of Marin, the Board of Supervisors, the Engineer, nor any officer or employee of the County shall be answerable or accountable in any manner for any loss or damage that may happen to the Work or any part thereof; of for any of the materials or other things used or employed in performing the Work; or for injury to any person or persons, either workers of the public; or for damage to property from any cause which might have been prevented by the Contractor, or his workers or anyone employed by him, against all of which injuries or damages to persons and property the Contractor, having control over such Work, must properly guard.

C. The Contractor shall be responsible for any liability imposed by law for any damage to any person or property resulting from defects or obstructions or from any cause whatsoever during the progress of the Work or at any time before the completion and final acceptance thereof. The Contractor shall indemnify and save harmless the County of Marin, the Board of Supervisors, the Engineer, and all officers and employees of the County from all suits or actions of every name, kind and description, brought for or on account of any injuries or damages received or sustained by any person or persons, by or from the Contractor, his servants or agents, in construction of the Work or by or in consequence of negligence in guarding the same, in improper materials used in its construction or by or on account of any act or omission of the Contractor or his agents. In addition to any remedy authorized by law, so much of the money due the Contractor under and by virtue of the Contract as shall be considered necessary by the Department of Public Works may be retained by the County until disposition has been made of such suits or claims for damages aforesaid.

7.16 ENTRY RIGHTS

The right is reserved to the County and to railway, water, gas, telephone, telegraph and electric power transmission companies to enter upon the Work for the purpose of making repairs and changes that have become necessary by reason or the Work. Projects financed in whole or in part with State or Federal funds shall be subject to inspection at all times by authorized representatives of the State or Federal Governments.

7.17 OCCUPANCY PRIOR TO ACCEPTANCE

The County reserves the right to occupy all or any parts of the Project prior to completion of the entire Contract, or upon written order therefor. In such event, the Contractor will be relieved of responsibility for any injury or damage to such part as a result from such occupancy and use by the County. If the Contractor carries insurance against damage to such premises or against liability to third persons covering the premises so used and occupied by the County, and if such occupancy results in increased premiums for such
insurance, the County will pay to the Contractor the added cost for such insurance during the period of occupancy.

7.18 ACCEPTANCE OF THE WORK

When the final inspection is completed and it has been determined that the Work is in accord with the requirements of the Drawings and Specifications, the Engineer will formally accept it in writing. After such acceptance, the Contractor will be relieved of protecting the Work, except for such correction or repair as shall be required to remedy any defect therein which occurs within the guarantee period. The Contractor will not be required to perform any further work thereon except such items as may be reserved specifically in the Specifications or formal written acceptance, and he shall be relieved of responsibility for injury to persons or property or damage which occurs after said acceptance.

7.19 CORRECTION OF ERRORS AND FINANCIAL RECOVERY

The County reserves the right to correct any error that may have been made in any estimate that has been paid. The County also reserves the right to claim and recover, by process of law, any sums sufficient to correct any error or make good any deficiency in the Work resulting from such error, or from dishonesty or collusion between any of the parties or individuals having dealings pursuant to the construction of the Work, regardless of when such error, dishonesty or collusion shall be discovered.

** END OF DIVISION 7 **
GENERAL CONDITIONS

DIVISION 8 – PROSECUTION AND PROGRESS

8.01 LABOR

A. The Contractor shall ensure that each and every kind of work shall be performed by workers, laborers or mechanics especially skilled in the class or category of work required, and that workmanship shall be of the best regardless of the quality of material.

B. Any person that the County may deem incompetent or disorderly shall be promptly removed from the Work by the Contractor, upon written notice therefor from the Engineer, and shall not be re-employed thereon.

8.02 SUBCONTRACTING

A. The Contract is subject to the provisions of Chapter 2, Division 5, Title 1, commencing with Section 4100, of the Government Code, which prohibits the subcontracting of the whole or any part of a contract to Subcontractors other than those named in the Contractor’s original Proposal.

B. The Contractor shall be responsible for all work performed under the Contract, and no Subcontractor will be recognized as such by the County. All persons engaged in the Work will be considered as employees of the Contractor.

C. The Contractor shall give his personal attention to the fulfillment of the Contract and shall keep the Work under his control. When any Subcontractor fails to prosecute a portion of the Work in a manner satisfactory to the County, the Contractor shall remove such Subcontractor immediately upon written direction from the Engineer, and he shall not again be employed on the Work.

D. Although the Specification Sections of the Contract may be arranged to various trades, or general grouping of work, the Contractor is not obligated to sublet the work in such manner. The County will not entertain requests to arbitrate disputes among Subcontractors, or between the Contractor and one or more Subcontractors, concerning responsibility for performing any part of the Work.

8.03 TIME LIMIT AND DAMAGES

A. The County will designate the starting date on which the Contractor shall commence the Work, and from which he shall diligently prosecute it to completion. The Contractor obligates himself to satisfactorily complete the Work on or before the expiration of the Project time limit stated in the Agreement, or by an agreed date as stipulated by the County, plus such additional days as may be properly allowed.
B. It is hereby agreed by the parties to the Contract that in case all the work called for thereunder, in all parts and requirements, is not finished or completed within the Contract time set forth, or as extended, damage will be sustained by the County. As it is and may be impracticable and extremely difficult to ascertain and determine the actual damage which the County will sustain in the event of and by reason of such delay, it is therefore agreed that the Contractor will pay to the County the sum stipulated in the Instructions to Bidders for each and every Working Days delay in finishing the Work beyond the time prescribed. The Contractor agrees to pay said Liquidated Damages as herein provided, and in case the same are not paid, agrees that the County may deduct the amount thereof from any money due or that may become due him under the Contract.

C. It is further agreed that, in case the work called for under the Contract is not finished and completed in all parts and requirements within the time specified, the Engineer shall have the right to extend the time for completion or not, as he may deem to be in the best interest of the County. If he decides to extend the said time limit, he shall have the right to charge to the Contractor, or his sureties, and to deduct from the final payment for the Work, all or any part, as he may deem proper, of the actual cost of engineering, inspection, superintendence and other overhead expenses to the County which are attributable to such extension.

D. The Contractor shall not be assessed with Liquidation Damages nor the cost of engineering and inspection during any delay in the completion of the Work caused by acts of God or of the public enemy, fire, flood, epidemics, quarantine restrictions, strikes, freight embargoes and unusual action of the elements, or delays of Subcontractors or suppliers due to such causes. The Contractor shall notify the Engineer, in writing, of the causes of delay within five (5) Working Days from the beginning of any such delay. The Engineer shall ascertain the facts and the extent of the delay, and his findings thereon shall be final and conclusive. No extensions of time will be granted in the absence of such written notification.

E. It is further agreed that, except in those cases deemed by the County to be so warranted, or except where expressly so provided, requests by the Contractor for extensions of time will not be acted upon by the County until such time as all work under the Contract is completed.

8.04 PROGRAMMING WORK

The Contractor may be required to submit to the Engineer a progress schedule showing the proposed sequence of operations in the performance of the Work. Loss of time for any cause during the period prior to the submission of the progress schedule will not be considered by the Engineer in his computation of time extensions.

8.05 SUSPENSION OF WORK

The Engineer shall have the authority to suspend the Work, wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the proper prosecution thereof, or for such time as he
may deem necessary due to failure on the part of the Contractor to carry out orders given, or to perform any provisions of the Work. The Contractor shall immediately obey such orders of the Engineer and shall not resume the Work until so directed in writing by the Engineer.

8.06 COUNTY’S RIGHT TO DO WORK

If the Contractor should, after demand, neglect to prosecute the Work properly with diligence or fail to perform any provision of the Contract, the County, after three (3) Working Days written notice to the Contractor may, without prejudice to any other remedy, make good any deficiencies resulting therefrom and deduct the cost thereof from any payment due the Contractor. Such action by the County shall not relieve the Contractor of any obligations arising hereunder, including the obligation to complete the Contract.

8.07 COUNTY’S RIGHT TO TERMINATE CONTRACT

A. If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should repeatedly refuse of should fail, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if he should fail to make prompt payment to Subcontractors, or for material or labor, or persistently disregard laws and ordinances or instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of the Contract, then the County may, without prejudice to any other right or remedy, after giving him seven (7) calendar days written notice, terminate employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon, and finish the Work by whatever method it may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance for the Contract price exceeds the expense of finishing the Work, including compensation for additional management and administrative services, such excess shall be paid to the Contractor. If such expense exceeds such unpaid balance, the Contractor shall pay the difference to the County. The Engineer shall certify expense incurred through the Contractor’s default.

B. The final determination as to whether there has been non-compliance with the Contract sufficient to warrant suspension thereof, and termination of the Contractor’s employment, rests with the Board of Supervisors. Its decision shall be binding on all parties to the Contract.

* * END OF DIVISION 8 * *
GENERAL CONDITIONS

DIVISION 9 – ACCEPTANCE AND PAYMENT

9.01 METHOD OF PAYMENT AND RETAINAGE

A. The Contractor shall, once in each month, submit to the Engineer a written Payment Request, in duplicate, on the form provided, estimating the total percentage of work performed, including that for approved Change Orders and the acceptable materials furnished and delivered by the Contractor on the Site but not used to the time of such estimate, and the value thereof according to his accepted Bid.

   1. In accordance with the revised Federal requirements for taxable miscellaneous income reporting, the Contractor, unless a corporation, shall include his Social Security number or Federal Tax Identification number on all invoices and Payment Requests. Any claims for payment received without such a number, unless from a corporation, may result in a delay in payment for which the County can assume no responsibility or liability.

B. Separate Payment Requests shall be submitted for the Site Development portion of the Contract, if any.

C. The Engineer shall, not later than the date when payment falls due, approve the Contractor’s Payment Request for such amount as he deems to be properly payable, or shall state in writing his legitimate reasons for withholding approval.

D. The County shall retain five percent (5%) of the value of work done as part security for the fulfillment of the Contract by the Contractor, and shall monthly pay him, while carrying on the Work, the balance not retained, as aforesaid, after deducting therefrom all provisions of the Contract.

E. Partial payments will be made not later than the fifteenth (15th) day of each calendar month for work done during the preceding calendar month, as certified by the Engineer. In preparing Payment Requests, material delivered to and properly stored on the Site, and preparatory work done, may be taken into consideration. Requests for payment must be submitted at least ten (10) calendar days in advance of the date set for payment.

F. Notwithstanding any other provisions contained herein regarding time of payment for any work performed, the County may delay, without penalty or payment for any work performed, the County may delay, without penalty or payment of interest, until 15 July of any year payment for any work performed between 15 May and 30 June of such year.

G. No payment will be made when, in the judgement of the Engineer, the Work is not proceeding in accordance with the provisions of the Contract or when, in his
estimation, the total value of the work done since the last payment amounts to less than three hundred dollars ($300). No progress payments will be made on any contract wherein the specified time limit is less than twenty-five (25) Working Days.

H. Should the County fail or refuse to pay when due, without fault or error on the part of the Contractor, the authorized sum of any Payment Request, the Contractor shall receive, in addition to said sum, interest thereon at the legal rate in force at the time and in the locale of the Work.

I. Material and work covered by partial payments shall become the sole property of the County. This shall no relieve the Contractor from responsibility for the care and protection of such materials and work, or restoration of damaged work, or act as a waiver of the County’s right to require fulfillment of all terms of the Contract. In the event that the Work has been damaged by other contractors, by others than employees of the County in the course of their employment, or as provided herein, the Contractor agrees to restore such damaged work without cost to the County, and to seek redress for damage only from those who directly caused it.

J. No approved Payment Request, nor payment made to the Contractor, nor partial or entire use or occupancy of the Site by the County shall be considered an acceptance of any work or materials not in accordance with the Contract.

K. Upon completion and acceptance of all work whatsoever required, and release of all claims against the County, the Board of Supervisors, at its regular weekly meeting, shall authorize the final payment. After thirty-five (35) calendar days and within sixty (60) after said authorization, and the recording of the Notice of Completion, the County shall pay to the Contractor the Contract price, less all prior payments, and any funds which the County is obligated by law or entitled hereunder to withhold.

L. The making of final payment shall constitute a waiver of all claims by the County other than those arising from unsettled liens, from faulty work or materials discovered after final payment, or from requirements of the Drawings or Specifications. Acceptance of final payment by the Contractor shall operate as a release to the county of all claims and of all liability to the Contractor for all things done or furnished in connection with the Work, and for every act and neglect of the County and others relative thereto, expecting the Contractor’s claim for interest upon final payment if this payment be improperly delayed, and all claims previously made and still outstanding. All prior estimates and payments shall be subject to correction in the final payment.

M. Guarantees as called for under the Contract shall remain in full force and effect for the prescribed time. No payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligations thereunder.
9.02 FORCE ACCOUNT PROCEDURE

A. Where there is failure to agree on the charges for changes in the Work, the changes shall be executed under Force Account, and an amount equal to the sum of the following items shall constitute full and proper compensation to the Contractor or the County for any and all overhead, profit or expense in performing or deleting such work, including, without limitation, any additional premiums on insurance or Contract Bonds, and such amount shall be added to or deducted from, as applicable, the price fixed by the terms of the Contract for the part of the Work affected. The percentages below shall apply only to work done under Force Account and shall not apply to any other changes to the Contract.

1. For Added Work, the contractor will be paid his actual cost for the labor, materials and equipment, computed in accordance with the provisions of this Article, directly required for the performance thereof, plus the following uncompounded percentages:
   a. For Labor: Ten percent (10%) for overhead, ten percent (10%) for profit and one percent (1%) for Bonds.
   b. For Material: Five percent (5%) for overhead, ten percent (10%) for profit and one percent (1%) for Bonds.
   c. For Equipment: Five percent (5%) for overhead, ten percent (10%) for profit and one percent (1%) for Bonds.

2. For Deleted Work, the Contract price will be reduced by a sum consisting of the fair and just estimated cost to the Contractor for furnishing the labor, materials and equipment which would have been used on such work, based on values prevailing at the time of the Bid, plus ten percent (10%) of such cost for overhead, profit and Bonds.

B. In order that a proper estimate may be made by the Engineer of the net cost of labor and materials entering into changed work, in accordance with the procedure herein stated, the Contractor shall furnish daily an itemized statement of materials and labor supplied, together with the cost of such material and the wages paid, and shall furnish vouchers for quantities and prices of such labor, materials or work. If the Contractor fails to comply with these provisions, he shall have no claim for compensations against the County for extra work.

C. The foregoing method for determining the price of work shall not apply to the performance of any work or the furnishing of any materials which are susceptible of classification under the items for which prices are established in the Contract, or are required or reasonably implied to be performed or furnished thereunder.

D. The County reserves the right to furnish such materials required as it deems expedient, and the Contractor shall have no claim for profit on the cost of such materials.
9.03 ACCEPTANCE

The Work will be accepted in writing by the Engineer when the whole shall have been completed in all respects in accordance with the Contract, to his full satisfaction.

9.04 GUARANTEE

A. The Contractor hereby unconditionally guarantees that the Work will be done in full accordance with the requirements of the Contract, and further guarantees the Work of the Contract to be and remain free of defects in workmanship and materials for a period of one (1) year from the date of written acceptance thereof, unless a longer guarantee period is specifically called for. The Contractor hereby agrees to repair or replace any and all work, together with any other adjacent work which may be displaced in so doing, that may prove to be not in accordance with the requirements of the Contract, or that may be defective in its workmanship or materials, within the guarantee period specified, without any expense whatsoever to the County, ordinary wear and tear and unusual abuse or neglect excepted.

B. The Contractor further agrees that within ten (10) calendar days after being notified in writing by the County of any work not in accordance with the requirements of the Contract, or of any defects in the Work, he will commence and prosecute with due diligence all work necessary to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time, and in the event he fails to so comply, he does hereby authorize the County to proceed to have such work done at his expense, and he will honor and pay the costs and charges therefor upon demand. The County shall be entitled to all costs and charges therefor upon demand. The County shall be entitled to all costs and expenses, including reasonable attorneys’ fees, necessarily incurred upon the Contractor’s refusal to so honor and pay the aforementioned costs and charges.

C. The Contract Bonds shall remain in full force and effect for the duration of the guarantee period.

** END OF DIVISION 9 **

** END OF GENERAL CONDITIONS **
NOTIFICATION OF ASBESTOS CONTAINING MATERIALS

As required under CA AB 3713 and Chapter 10.4 of the California Health and Safety Code, agencies that own buildings constructed prior to 1979 shall provide notification to contractors, renters and employees of known asbestos-containing building materials. Section 25915.1 of the code provides for adoption of an asbestos management plan, which has been completed by an AHERA accredited building inspector and management planner.

In developing the plan, inspections of County owned buildings, including the Civic Center buildings, the Marin Center, Exhibit halls, fair offices, General Services buildings, libraries, fire stations and lookouts were conducted. Samples of suspected asbestos-containing materials, (ACM), were taken and submitted to a laboratory for analysis. A listing of the specific locations within the buildings where asbestos-containing materials are present is on the opposite side of this notice.

The survey has concluded that all of the ACM within the buildings are in good or fair condition and have low potential for significant damage or disturbance. The materials are intact and pose minor risks for releasing airborne fibers. The buildings are inspected regularly to verify that all asbestos-containing materials remain in good condition.

Asbestos containing materials pose no threat to your health, unless the fibers become airborne due to damage or deterioration. As a result, it is important for employees and contractors to follow proper work practices to minimize the potential for disturbance. Do not drill holes, hang plants or other objects from walls/ceilings made of ACM. Avoid disturbing ACM in any manner. If you find ACM that has been damaged, report the condition to your supervisor or the Department Public Works, Capital Projects Division at (415) 499-7877.

Only persons authorized and properly trained should perform any work that may disturb the asbestos materials. It is recommended that any persons working in the above ceiling spaces should have Cal / OSHA Class 4 training. All contractors are responsible for their own health and safety procedures, and any monitoring to confirm safe exposure levels to asbestos or other regulated contaminants. An Operations and Maintenance program has been developed which is intended to minimize any releases of ACM by providing for training of custodial and maintenance personnel, regular inspections of ACM and thorough notification for all workers and building occupants. Licensed abatement contractors, using AHERA trained workers, will only perform asbestos removal work. The asbestos abatement work area will be off-limits to all other workers in the building. The asbestos containment area will be clearly identified by danger signs and barricades to limit access.

You are required to provide a copy of this notice to each of your employees and sub-contractors working in these buildings.

A copy of the asbestos management plan, including the complete materials survey, is provided here. Refer to Section VIII. MARIN CENTER EXHIBIT HALL ENVIRONMENTAL SURVEY (JULY 2019).
SPECIFICATIONS
SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Project Conditions.
   4. Work Sequence.
   5. Contractor Use of Premises.
   6. Access to site.
   7. Posting of Materials Information.
   8. Owner-Furnished Products.
   9. Coordination.
   10. Reference Standards.

B. Contractor shall include as part of its Bid any costs associated with scheduling and performing work in accordance with the limitations set forth in this article.

1.3 PROJECT INFORMATION

A. Project Identification: Marin Center Exhibit Hall Seismic Retrofit, Project No. CAP 19-1101.
   1. Project Location: Marin Center Exhibit Hall, 10 Avenue of the Flags, San Rafael

B. Owner: County of Marin, Department of Cultural Services
   2. County Representatives:
      a. Mike Gibson, Stationary Engineer (415) 686-5073.
C. Owner's Consultants: Owner has retained the following consultants who will oversee portions of the Work:


1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following. Refer to the plans and specifications for further information.

1. Mobilization / Demobilization (BID ITEM NO. 1)
   a. Perform all required preparatory tasks, including but not limited to: all work required to mobilize, including preparation of the site, and installation of temporary site protections; preparing of required construction submittals; and, the cost for pre-paid bonds and insurance.
   b. Perform all required closeout tasks, including but not limited to: all work required to demobilize, including removal of contractor equipment and materials and site cleanup; at the preparation and submittal of required closeout materials.

2. Seismic Retrofit (BID ITEM NO. 2)
   a. Remove and store light fixtures and other appurtenances and perform demolition of existing wall and ceiling finishes to expose roof framing. Follow protocols for abatement wherever materials identified as containing asbestos or lead is scheduled to be disturbed. Refer to this manual, sections V. Notification of Asbestos Containing Materials and 02 82 13 for requirements related to the removal, handling and disposal for hazardous materials;
   b. Remove and/or reroute existing mechanical ducts, electrical conduits, piping, etc., as required, to provide clear access to the structural members slated for retrofit.
   c. Perform structural retrofits, as identified in the Contract Documents. Including, but not limited to:
      i. Installation of new wall anchors and cross ties, and improvements to the roof diaphragm.
      ii. Installation of supplemental columns for support of long span glu-lam roof girders in the main exhibit space.
   d. Restore utility system, reinstall fixtures and appurtenances, and patch/paint disturbed building finishes, and perform other incidental associated work necessary to return the space to its pre-retrofit condition.
3. Accessibility Upgrades (BID ITEM NO. 3)
   a. Perform all required work necessary to complete code required accessibility upgrades, as identified in the Contract Documents. Including, but not limited to:
      i. Furnish and install access new accessible drinking fountains;
      ii. Furnish and install new or replacement electronic door actuators, and survey and repair, as needed, existing accessible door hardware;
      iii. Survey, repair or install new accessible room signage and furnish and install new occupancy signage;
      iv. Reconfigure the accessible seating platform in the theater, and make modifications to the handrails, as shown on the Contract Documents; and
      v. Perform accessibility modifications to the restrooms, as shown on the Contract Documents.

4. Bid Alternates
   a. ALTERNATE 1: NOT USED
   b. ALTERNATE 2: NOT USED
   c. ALTERNATE 3: THEATER LED LIGHTING
      i. Perform all work necessary to replace [E] theater downlights with new LED fixtures.

B. Contract Method:
   1. Project will be constructed under a single prime contract.

1.5 PROJECT CONDITIONS

A. Provide safety precautions to separate the work area(s) from pedestrian or vehicular traffic and to prevent damage to the building, its occupants and the surrounding areas. Observe applicable Federal O.S.H.A. and California State O.S.H.A. requirements.

B. Supply labor and equipment to accomplish the work.
   a. Coordinate with County abatement consultants prior to proceeding with work in which materials identified as containing asbestos are disturbed.

   b. Repair or replace items damaged caused by contractor negligence.
c. Perform all work in accordance with applicable Federal, State and local code requirements.

d. Workmanship and materials shall be in accordance with manufactures instructions and code requirements. Specification requirements that exceed the minimum requirements of the manufacture take precedence.

e. Coordinate the work in this section with other sections, including preparatory work, building protection, daily clean up and protection of building occupants and contents.

f. Supply labor and equipment necessary to maintain a clean environment in the interior and exterior building and site areas around the construction.

1.6 CONTRACTOR USE OF PREMISES

A. Coordinate use of premises under direction of the Owner.

B. Contractor shall limit all work activities and use of premises so as not to interfere with or disrupt Owner's access and continuous use of the driveway, parking areas and adjacent fairground property.

C. The Contractor shall be responsible for maintaining the area of work and adjacent areas broom clean. Carpets, furnishings and other surfaces shall be kept dust and debris free.

D. Because on-site storage is for the Contractor's convenience and is furnished as a courtesy by the Owner, the Contractor is cautioned to provide for the security of its stored property. The County of Marin, as Owner, will accept no responsibility for damage or loss due to vandalism, theft or any other cause.

1.7 ACCESS TO SITE

A. General: Contractor shall have access to and use of Project site for construction as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Designated Utility Disruption Work Window

  1. Following contract award, the Owner, in coordination with the Contractor, shall designate a series of work window during which the Contractor may disconnect power for the purpose of relocating conduits for performance of the retrofit work.

     a. Once agree upon, the Contractor shall be responsible for insuring that all materials are delivered and the work completed during the designated windows.

C. Construction Limits
1. Confine construction operations to areas where work is permitted.

2. Keep driveways, and the pathway to the building’s south entrance clear and available to Owner's employees. Insure access to the building’s main entrance is accessible to fire and other emergency responders at all times.

3. The County shall designate space within the building for the temporary storage of furniture, fixtures and equipment designated to be removed, stored and reinstalled in association with performance of the work.

4. Contractor may utilize the loading area outside the main exhibit hall, and the parking spaces directly adjacent to the mechanical room for storage of materials during construction.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
   c. Contractor shall be responsible for providing ADA access of pedestrian detours if required.

1.8 POSTING OF MATERIALS INFORMATION

A. All materials utilized in the construction process or incorporated into the project shall have information posted on the premises where the Contractor's operations are conducted in performing the Work of this Project.

B. Manufacturer's Safety Data Sheets shall be posted in accordance with OSHA's "Hazard Communication Standard", in a manner so as to be clearly visible to persons passing by the project site and so as not to mar or cause damage to existing building surfaces.

1.9 WORK RESTRICTIONS

A. General: Comply with restrictions on construction operations.

   1. Comply with limitations on use of public streets, applicable construction noise ordinances, and other requirements of authorities having jurisdiction.

B. Utility Disruptions: Utility shutdown windows shall be scheduled at the beginning of the project. Contractor shall notify the County Building Operations staff 72-hours in advance of each scheduled shutdown.
1.10 COORDINATION

A. Drawings and general provisions of the Contract, including Drawings, General Conditions and this Division 1, apply to Work of all Sections.

B. Coordinate work of the various Sections of these Specifications to assure efficient and orderly sequence of installation of construction elements. Make provisions for accommodating items or work that might require installation or performance at later times.

C. Coordinate with County’s abatement consultants prior to proceeding with work that disturbs materials identified as containing asbestos.

1.11 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement, except when a specific date is specified.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

D. In the event that referenced specifications or standards contain general requirements in conflict with these Drawings, General Conditions or the scope of work of individual Sections of the Specifications, the provisions of the Contract Documents shall govern.

E. Where conflict occurs between regulations, standard manufacturer's specifications, codes, the Drawings and Specifications, and governing agencies, the most restrictive shall apply. Nothing in the Drawings or Specifications is to be construed to permit work not conforming to code.

F. Work shall be governed by the best trade practices.

G. All work shall be performed in strict accord with the latest applicable codes and regulations, including, but not necessarily limited to:
   1. Cities and County of Marin, and California Fire Marshals.
   2. California Occupational Safety and Health Act (CAL/OSHA).
   4. Safety Orders of the California State Division of Industrial Safety.
   5. National Board of Fire Underwriters (NBFU).
   7. Underwriters’ Laboratories, Inc. (UL).
10. National Electrical Manufacturer’s Association (NEMA).
11. Sheet Metal and Air Conditioning Contractor’s National Association (SMACNA)
12. Wood Institute of California (WIC)
14. Cities and County of Marin Building Ordinances.

1.12 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

END OF SECTION 011000
PART 1 - GENERAL

1.1 SUMMARY
   A. Provide coordination, planning, scheduling and control to perform Work and meet requirements of Project.
   B. Contractor will participate in preconstruction conferences and other project meetings.

1.2 CONTRACTOR USE OF PREMISES
   A. Construction and installation shall conform to the schedule and work restrictions outlined in this manual.
   B. Contractor shall limit all work activities and use of premises so as not to interfere with or disrupt Owner’s occupancy and public access and use of the other Marin Center facilities and surrounding areas. Specifically, any and all work which would produce excessive noise and/or disruption to normal activities shall not be performed during any events which the Owner has scheduled to take place adjacent to the project construction site. Marin Center facilities include the Veterans Memorial Auditorium, Fairgrounds and Lagoon Park.
   C. Contractor shall include as part of its Bid any costs associated with scheduling work in accordance with the limitations set forth in this Paragraph.

1.3 COORDINATION WITH OTHER PARTIES
   A. Coordinate construction schedule with the County Project Manager as soon as possible or as indicated in other sections after award of contract.
   B. Notify and coordinate with owner’s representative 72 hours in advance if Work requires disruption of any or all services.
   C. Coordinate with owner’s representative regarding access, security, protective measures, clean-up, and expected weather.
   D. Cooperate and coordinate with other Contractors, consultants and County Maintenance Staff during the performance of the Work.
      1. The County intends to contract with a licensed electrical contractor to perform upgrades to the electrical system within the Exhibit Hall, specifically replacement of electrical panels, while the Seismic Retrofit Project is being performed. Performance of this electrical require that the electrical contractor be given full access to the panels and...
associated electrical infrastructure and will entail one or more scheduled power shut-
down. The electrical contractor will be given two weeks to perform this work, as
directed by the County, and the Seismic Retrofit Contractor shall accommodate
performance of that work during the two weeks without condition.

E. Coordinate with County’s abatement monitoring consultant prior to proceeding with
work that disturbs materials identified as containing asbestos.

1.4 PRE-CONSTRUCTION CONFERENCE

A. Owner will schedule a preconstruction conference within 15 days after notice of award.
The County will record meeting notes; and distribute record copies.

B. Attendance: DPW Project Manager, Engineer, Contractor and other Owner/Occupant
Representatives.

C. Agenda will include, but will not be limited to:
   1. Distribution of Contract Documents (if not previously accomplished).
   2. Submittal of list of products, schedule of values, and progress schedule.
   3. Designation of responsible personnel.
   4. Procedures and processing of field decisions, submittals, substitutions, applications
      for payment, proposal requires, change orders, and Contract close-out procedures.
   5. Scheduling.
   6. Staging, storage areas, location of debris boxes, etc.
   7. General housekeeping procedures.
   8. Inspections.

D. Contractor shall bring the following to the pre-construction meeting:
   1. Baseline Construction Schedule.
   2. List of Project Submittals.
   3. Schedule of Values.

1.5 CONSTRUCTION KICK-OFF

A. The County Representative will schedule a Construction Kick-off meeting prior to the
start of work in the field. Meeting will include an inspection of the Exhibit Hall. The
Contractor will record conference results; and distribute record copies.
B. Attendees: In addition to representatives of Owner, Engineer, and Contractor, and Marin Center Staff shall be represented.

C. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
   1. Existing Conditions.
   2. Fire prevention.
   3. Sequence of work.
   4. Storage, protection, and accounting for salvaged and specially fabricated items.
   5. Collection of waste, protection of occupants and the public, and condition of other construction that affects or will affect the Work.

1.6 PROGRESS MEETINGS

A. The Contractor will schedule and administer project meetings throughout progress of Work. Meetings shall be scheduled at bi-weekly intervals, unless otherwise agreed to by all parties.

B. Attendance: Contractor’s representative, Contractor’s superintendent, major subcontractors and suppliers; Owner, and Engineer as appropriate to agenda topics for each meeting.

C. Contractor shall bring the following to each progress meeting:
   1. Meeting Agenda
   2. Updated Construction Schedule
   3. 2-Week Look-ahead Schedule

D. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery of schedules, submittals, RFI, change orders, maintenance of quality standards, pending changes and substitutions, and other items affecting the progress of Work.

D. Contractor shall record notes for each meeting, and distribute record copies at the subsequent progress meeting.

1.6 PROJECT CLOSE-OUT MEETING

A. Upon notice from the Contractor that the project is Substantially Complete, the County Representative will schedule a closeout meeting with the Contractor, Engineer and County Representatives to determine the status of completion.
B. The Contractor shall attend the Close-out meeting scheduled by the County Representative to discuss the close-out procedure and responsibilities of the Contractor and the County.

C. The County Representative will prepare a list of actions which are still open or pending that need to be resolved during the close-out period. Such actions may include, but are not necessarily limited to, equipment testing, operator training, record documents, final inspection, administrative activities, and documentation of final quantities and force account work.

END OF SECTION 013113
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Procedures
2. Construction Progress Schedules
3. Schedule of Values
4. Product Data
5. Manufacturer’s Instructions and Certificates
6. Samples

1.2 PROCEDURES

A. Develop a submittal numbering protocol with Owner that will be used throughout the project.

B. Prior to the start of work, Contractor shall provide a list of all required submittals, with a schedule for their delivery and review. Coordinate the timelines for key submittals with the baseline Project Schedule.

C. Maintain an up-to-date log of all submittals to be reviewed at weekly progress meetings that includes, but is not limited to, the following information:

1. Specification Section
2. Type of Submittal (Shop Drawings, Product Data, Manufacturers Certificates, etc.)
3. Title of Submitted Item
4. Date Submitted
5. Date Returned by Owner/Architect
6. Status (Reviewed, Make Corrections Noted, Revise and Resubmit, For Record Only, etc.)

D. Deliver submittals to Owner's representative as established at pre-construction conference.

E. Transmit each item under Consultant-accepted form. Identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for review stamps.
F. After Engineer’s review of submittal, revise and resubmit as required, identifying changes made since previous submittal.

G. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Prior to the start of work, Contractor shall submit a baseline Project Schedule for review and approval by the Owner.

1. Schedule shall be in the format of a horizontal bar chart illustrating a complete sequence of construction by activity from start to finish, and shall account for each work day of each week through the completion of the project.
2. Show complete sequence of construction by activity, identifying work of separate phases, and other logically grouped activities.
3. Show key pre and post-construction activities to be performed within the contract duration;
4. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including those furnished by Owner.

B. Include an updated Project Schedule with percentage of completion for each activity with each Application for Progress Payment.

1.4 SCHEDULE OF VALUES

A. Prior to the start of work, provide Owner with a Schedule of Values for the purpose of tracking progress payments against payment requests. Contractor shall produce a typed schedule on AIA Form G703 or an approved equivalent form.

B. Format: Identify each line item with number and title of the major specification sections.

C. Schedule of Value shall be formatted in such a way that allows work progress and contract costs to be tracked.

D. Include in each line item a directly proportional amount of Contractor's overhead and profit.

E. All mobilization and demobilization costs shall be included in a single line, which shall be paid out in the following increments: 30% for pre-construction activities, 30% for on-site mobilization, and 40% for final demobilization and closeout activities.

F. Revise schedule to list change orders for each application for payment.
1.5 PRODUCT DATA

A. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work.

B. Submit the number of copies which Contractor requires, plus one copy which will be retained by the Owner. Exceptions: structural, mechanical, and electrical submittals shall be submitted in a quantity to provide that three copies be retained, in addition to the quantity Contractor requires returned to him.

1.6 MANUFACTURER’S INSTRUCTIONS AND CERTIFICATES

A. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation adjusting, and finishing, in quantities specified for product data.

1.7 SAMPLES

A. When required in individual Specification Sections, submit samples of finish materials to be approved by Owner and Architect.

B. Submit the number of samples which Contractor requires, plus one which will be retained by the Owner.

END OF SECTION 01 33 00
PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. The Owner and County Project Manager will schedule a Pre-Construction meeting follow the Notice to Proceed and a Construction Kick-off meeting prior to the start of work in the field. Refer to Section 01 31 13.

B. Coordination Meetings: The Contractor will conduct progress meetings specifically for alteration work at intervals to be determined at the pre-construction conference. The Contractor will record meeting results; and distribute record copies. Refer to Section 01 31 13.

C. Specialist Qualifications: A firm regularly engaged in specialty work similar in nature and extent to work as specified in each Section and that has completed a minimum of five (5) recent projects with a record of successful in-service performance.
   1. Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.

D. Abatement: The County shall contract with a certified Abatement Contractor to perform demolition or other work necessary for the project that disturbs building materials that have been identified as containing asbestos. Refer to Section 02 11 00.
   1. Contractor shall meet with the County hired abatement monitoring consultant and Abatement Contractor at the start of the project to identify locations where pre-construction abatement will be needed.
   2. Contractor shall coordinate with the County’s monitoring consultant to schedule abatement work in advance of proceeding with work that may impact materials identified as containing asbestos. Abatement work shall only be performed when no staff is present.

E. Alteration Work Program: Prepare a written plan for Project, including protection of surrounding materials during operations. Include dust and noise control, means of egress, debris-hauling routes, and temporary protective barriers.
   1. Contractor shall be responsible for covering all furniture, fixtures, equipment, appurtenances such as draperies, etc., to prevent any damage due to dust or debris throughout construction.
2. Contractor shall be responsible for dismantling and then reassembling system furnishings, fixed shelving or other appurtenances found to be obstructing Contractor’s access to the work area.

3. If required to perform the work, Contractor shall contract with only IATSE LOCAL 16 union labor to remove, re-install or otherwise handle the following:
   a. Theatrical Lighting and associated Electrical Distribution Components.
   b. Draperies, Theater Sets or other Specialized Event Elements.
   c. Audio Visual Installations.

4. Furniture, fixtures and equipment removed to make way for the work shall be stored onsite in a location specified by the Owner.

F. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire-control devices during each phase or process.

G. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

H. Salvaged Materials for Reinstallation: Repair and clean items for reuse and reinstall items in locations indicated on the plans.

I. Discrepancies: Notify County Project Manager of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, surrounding surfaces of building, building contents, building site surfaces, amenities and surrounding landscaping from harm resulting from alteration work or spillage.

1. Provide temporary barricades, barriers, directional signage, and covers over exterior walkways to protect and exclude the public from areas where deliveries or material staging is conducted.

2. Erect temporary barriers to form and maintain fire-egress routes.

3. Take any and all precautions necessary to contain dust and debris generated by alteration work, and prevent it from reaching the carpeting,
draperies, audience seating, stage sets and equipment, control room equipment or other features located within the Showcase Theater.

4. Do not move friable materials outdoors during winds of sufficient force to spread them to unprotected surfaces.

B. Protect existing materials, including floors along hauling routes, with temporary protections and construction.

1. Use covering materials and masking agents that will not stain or leave residue on surfaces. When no longer needed, promptly remove protective materials.

C. Comply with each product manufacturer's written instructions for protections and precautions.

D. Utility and Communications Services: Notify Owner; County Project Manager; authorities having jurisdiction; and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations. All plumbing and electrical disconnections shall be coordinated with the Marin County Building Maintenance Division at least 72 hours prior to work. The Building Maintenance Division will coordinate and assist in disconnection of services as required. Contractor will be responsible to provide temporary services during interruptions to existing utilities, as required.

3.2 PROTECTION FROM FIRE

A. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."

B. Fire Watch: When working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B and NFPA 241.

C. Fire-Control Devices: Maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids.

D. Sprinklers: When sprinklers are present, maintain sprinkler protection without interruption. While operations are performed close to sprinklers, shield them temporarily with guards and remove guards when nearby work is paused or completed.
3.3 GENERAL ALTERATION WORK

A. Record existing condition before each procedure (preconstruction), and record progress during the work. Use digital photographs.

1. Provide Owner copies of progress photographs on a CD upon substantial completion.

B. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

C. At the completion of each work day, the work area shall be clear of debris, dust or accumulation of materials generated or required as part of the project. All debris created for disposal shall be appropriately containerized and removed from the premises.

D. The contractor shall be responsible for repairs of damage to floors, floor coverings, walls, ceilings, windows, curtains, fixtures, or other items contained within the area where the work is performed.

END OF SECTION 01 35 16
SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching including, but not limited to, the following:
   1. General cutting and patching as required during execution of the Work

B. Related Sections include the following:
   1. 01 35 16 Alteration Project Procedures

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1. The County’s Abatement Contractor and abatement monitoring consultant shall participate in the Cutting and Patching Conference.

1.4 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

B. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Show projected percentage of completion for each item of Work as of time of each Application for Progress Payment.

C. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including those furnished by Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

   1. Cutting of drywall or other asbestos containing materials shall be performed by a qualified abatement contractor.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Abatement: Before proceeding with the work, consult the County’s abatement consultants to determine whether the material has been identified as containing asbestos.

2. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.

3. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

A. Abatement: Coordinate with County’s abatement consultants prior to proceeding with work that disturbs materials identified as containing asbestos.

1. Contractor shall meet with the County hired abatement monitoring consultant and Abatement Contractor at the start of the project to identify locations where pre-construction abatement will be needed.

2. Contractor shall coordinate with the County’s consultants to schedule abatement work in advance of proceeding with work that may impact materials identified as containing asbestos. Abatement work shall only be performed when the library is closed to the public and no library staff is present.

B. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition,

C. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage
elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

5. Proceed with patching after construction operations requiring cutting are complete.

D. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
   b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.

E. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 29
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes procedures and requirements for Contract Closeout.

B. Related Sections:
   1. Section 01 78 23 – Operations and Maintenance Data
   2. Section 01 78 36 – Warranties

1.2 PROCEDURES

A. The Contractor shall submit all outstanding change orders, claims, and time extension requests as required by the County Representative and per the Contract Documents. All requests shall be submitted before the Work is 95% complete.

B. Close-out Meeting
   1. Upon notification by the Contractor of Substantial Completion of the Project, the County Representative will schedule a closeout meeting with the Contractor, Architects or County Representatives and consultants to determine the status of completion.
   2. The Contractor shall attend the Close-out meeting scheduled by the County Representative to discuss the close-out procedure and responsibilities of the Contractor and the County.
   3. The County Representative will prepare a list of actions which are still open or pending that need to be resolved during the close-out period. Such actions may include, but are not necessarily limited to, equipment testing, operator training, record documents, final inspection, administrative activities, and documentation of final quantities and force account work.

1.3 SUBSTANTIAL COMPLETION

A. Substantial Completion:
   1. Notify the County Representative in writing that the Work is substantially complete and ready for inspection.
   2. Upon receipt of Contractor’s written notice, the County Representative will make an inspection to determine the status of completion.
3. Should the County Representative determine that the Work is not substantially complete; the County Representative will so notify Contractor with a deficiency list of all items that shall be completed before the County considers the Work substantially complete.
   a. Remedy all deficiencies as identified and notify the County Representative, in writing, when the Work is ready for re-inspection.

4. If the County Representative concurs that the Work is substantially complete, the County Representative will prepare a Notice of Substantial Completion, accompanied by a punch list of remedial work items to be completed or corrected prior to final acceptance.
   a. If the Work is not substantially complete, the County Representative will follow the same procedure as for the first inspection, and Contractor shall reimburse the County for all additional re-inspection costs.

5. Upon receipt of the Notice of Substantial Completion, the Contractor shall:
   a. Demobilize and perform through cleaning of the Work Area;
   b. Submit to the County Representative keys and tools necessary to operate and maintain the Work Area; and
   c. Return the Work Area to public use.
   d. Submit to the County Representative with the application for payment just before Substantial Completion of all project phases, a statement of all Change Orders, Modifications, claims, and time extension requests.
   e. Verify that the following administrative closeout submittals have been received by the County, if applicable:
      1) Project Record Documents and approved shop drawings, product data, and samples as specified in this Section, Section 01 33 00, and elsewhere in the Specifications.
      2) Operations and Maintenance Data Binders as specified in Section 01 78 23.
      3) Warranties as specified in Section 01 78 36.
      4) Spare parts and materials extra stock.
   f. Submit to the County Representative written certification that the Contract Documents have been reviewed, Work has been inspected, the Work is complete, including start-up, testing, conforms to the requirements of the Contract Documents.

6. At no additional cost to the County, restore and replace, as specified and as determined by the County, material and finishes damaged due to the performance of the Work.
   a. Restoration or replacement shall be equal quality and match the appearance of the existing Work.
1.4 FINAL ACCEPTANCE

A. Final Acceptance:

1. At no additional cost to the County, perform all remedial work noted on the punch lists before requesting a final inspection and acceptance.
2. Coordinate the performance of remedial work with the County to cause minimal inconvenience and interruption of the County’s operations.
3. Perform final cleaning as specified in this Section. Remove protective coverings and similar items.
4. Remove all temporary controls, utilities, facilities, field offices and sheds.
5. Submit the final payment request with releases and an updated final statement with supporting documentation, accounting for final additional charges for extras and liquidated damages for delays.
6. Submit consent of surety to final payment.
7. Submit a certified copy of the County Representative’s punch list of remedial items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance by the County.
8. Failure to complete all remedial work and prerequisites for final inspection within the time allowed after the date of Substantial Completion as specified in the Supplementary Conditions will result in liquidated damages being assessed.

B. Final Inspection:

1. Notify the County in writing that all punch list items of remedial work has been completed and the Work is ready for final inspection.
2. The County Representative will make an inspection to verify the status of completion.
3. Should the County Representative determine that the Work is not complete or is defective, the County Representative will so notify Contractor, in writing, listing remaining incomplete or defective work.
   a. Promptly complete the remaining deficiencies and notify the County Representative, in writing, when ready for re-inspection.
   b. If the County Representative finds the Work is still not complete, Contractor shall be responsible for all subsequent re-inspection and meeting costs incurred by the County to resolve the remaining issues. Such costs will be deducted from progress payments owed to Contractor.
4. When the County Representative determines that the Work is acceptable under the Contract Documents and Contractor has made all required closeout submittals, the County Representative will initiate the final payment recommendation and prepare the Certificate of Completion.
C. Prior to the final payment recommendation, the County Representative shall be furnished with the following administrative close-out submittals:

1. Project Record Documents;
2. Warranties;
3. Spare parts and materials extra stock;
4. Certificates of Final Inspection and Occupancy as evidence of compliance with the requirements of governmental agencies having jurisdiction; and
5. Evidence of payment and release of liens.

D. Submittals for final adjustment of accounts shall include, but not necessarily be limited to:

1. Request for Final Payment; and
2. Final statement of accounting, payroll records, and final change orders showing adjustments to the Contract Price for all force account work and extra payments.

E. All prior estimates and payments shall be subject to correction in the final estimate and payment.

1.5 FINAL CLEANING

A. Final acceptance of the work by the County will be withheld until the Contractor has satisfactorily complied with the requirements herein for final cleanup of the project site.

B. Should the County elect to partially occupy or use portions of the Work prior to Completion, perform final cleaning for those portions of the Work prior to their being so occupied or used.

C. Comply with applicable regulatory requirements during cleaning and disposal operations. Use cleaning materials which will not create hazards to health or property or cause damage to products or work.

D. Use only cleaning materials and methods which are compatible with the surface being cleaned, as recommended by the manufacturer of the products to be cleaned.

E. Provide final clean-up and damage repair at the conclusion of the project. Leave the premises neat, clean and free of tools. Clean-up shall include and not be limited to:

1. Floors vacuumed and cleaned per manufacturer’s instructions.
2. Upholstered seats, drapes, fabric acoustic panels, etc. vacuumed.
3. Hand dusting and cleaning of all surfaces, shelving, cabinetry, casework, glass, windows, or other surfaces in within the immediate work area.
4. Repair or replacement of property damaged during final completion of the project.
1.6 PROJECT RECORD DOCUMENTS

A. Submit the final approved Project Record Drawings to the County Representative prior to final payment. Project Record Documents shall include but not be limited to the following:

1. As-Built Drawings of all drawing sheets updated with all RFIs and owner-approved modifications and field directed changes.
2. All Operations and Maintenance information binders (see Section 017823).

1.7 OPERATOR INSTRUCTION

A. Refer to individual Specification Sections for specific requirements for equipment and systems demonstration and safety, operations, and maintenance training.

B. Where specified in the individual Specification Sections, furnish qualified personnel and coordinate scheduling for on-site instruction of the County's operating and maintenance personnel.

C. Contractor shall video record each training session and provide to the County a DVD copy.

1.8 RELEASE OF LIENS OR CLAIMS

A. Before the County issues final payment to Contractor for Work, Contractor shall sign and deliver to the County a release of liens or claims sworn to under oath and duly notarized. The release shall state that Contractor has satisfied all claims and indebtedness of every nature in any way connected with the Work, including, but not limited to, the foregoing, all payrolls, amounts due to the subcontractors, accounts for labor performed and materials furnished, incidental services, liens, and judgments.

B. If any liens or claims remain unsatisfied after all payments to Contractor have been made, Contractor shall refund to the County all moneys that the latter may be compelled to pay in discharging such a lien or claim, including all costs and a reasonable attorney's fee.

END OF SECTION 017700
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements and formats for Operation and Maintenance Data Manual (O&M).

B. Related Sections:
   1. Section 01 33 00 – Submittals.
   2. Section 01 77 00 – Close Out Procedures
   3. Section 01 78 36 – Warranties

1.2 OPERATION AND MAINTENANCE DATA REQUIREMENTS

A. The Contractor shall submit in the format specified herein, a complete package for Operation and Maintenance Data (O&M Manual), to include instruction manuals for installation, operation, maintenance, and lubrication requirements for each component of mechanical, electrical, mechanical, or other equipment and systems.

B. The Contractor shall inform all equipment manufacturers and subcontractors of these requirements and ensure that all associated costs are included in the costs for furnishing the equipment or system.

C. The Contractor shall submit plan view drawings to scale to show the as-built layout of work for irrigation work, mechanical, work, electrical work and/or as required by specifications.

1.3 SUBMITTAL AND SCHEDULING REQUIREMENTS

A. Schedule Requirements: The Contractor shall include in the submittal schedule each submittal listed herein in accordance with Section 01 33 00.

B. Substantial Completion Submittal: The Contractor shall submit a draft O&M manual in electronic format as described herein. County Representative will review draft and return one copy with comments.

C. Final Completion Submittal: As a requirement of the project closeout and prior to request for final payment, the Contractor shall submit 2 hard copies and 2 electronic copies of the approved O & M manual and 1 training session DVD not less than 15 days prior to Final Completion, as described herein.
1.4 ELECTRONIC FORMAT

A. O & M Manual Text and Manufacturers Data:
   1. Scan materials into a PDF file format, to a minimum of 400 DPI and save to CD or DVD.
   2. Organize data on a disk, in a manner similar to the hard copy of a binder, using a table of contents and folders for each component of mechanical, electrical, irrigation equipment, or other equipment and systems. Organize information related to each component within that folder.
   3. The CD shall be placed in a jewel case with a label indicating Project Name, Contract Number, “Operations and Data Manual 1 OF X”, and Date.
   4. The Contractor shall submit (3) copies of the CD/DVD as part of Closeout procedures as specified in Section 01 77 00.

B. O & M Manual As-Built drawings and/or diagrams:
   1. Each drawing shall be color scanned, 400 DPI, and saved to a CD.
   2. Each pdf file shall be numbered with prefix “SHT-01-” followed by the drawing number.
   3. The CD shall be placed in a jewel case with a label indicating Project Name, Contract Number, “Operations and Data Manual 2 OF X”, and Date.
   4. The Contractor shall submit (4) copies of the CD as part of Closeout procedures as specified in Section 01 77 00.

C. Training DVD:
   1. Contractor shall video record each training session and submit recordings on a DVD in MP4 or another Microsoft compatible format.
   2. Place DVD in a in a jewel case with a label indicating Project Name, Contract Number, “End-User Training Video”, and Date.

1.5 HARD COPY FORMAT

A. O & M Manual Text and Manufacturers Data
   1. Prepare data in the form of an instructional manual.
   2. Binders: Commercial quality, 8-1/2 x 11 inch three-ring binders with hardback, cleanable, plastic covers; one-inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
   3. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; list title of Project; identify subject matter of contents.
4. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
5. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
6. Text: Manufacturer's printed data, or typewritten data on white bond paper.
7. The Contractor shall submit (1) binder copy as part of Closeout procedures as specified in Section 01 77 00.

B. O & M Manual Text As built drawings and/or diagrams.
   1. Submit copies of each drawing.
   2. Drawings shall be printed on bond paper, in full color to scale and shall be folded and included with sleeved folder in binder.
   3. The Contractor shall submit (1) folded copy, and the originals, as part of Closeout procedures as specified in Section 01 77 00.

1.6 INSTRUCTION OF COUNTY PERSONNEL
A. Before final inspection, provide detailed instructions to the County's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
B. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
C. Instruction shall include a thorough discussion of the O&M manual; including but not be limited to, operation and maintenance of the specific equipment and products installed, telltale signs of malfunctioning and their solutions, other pertinent topics that relate to optimum system operation.
D. Prepare and insert additional data in Operation and Maintenance manual when need for such data becomes apparent during instruction.

END OF SECTION 01 78 23
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Requirements.
2. Submittal Requirements.
4. Warranty conditions.
5. Form of Guarantee/Warranty.

B. Related Sections:

1. Section 01 77 00 – Close Out Procedures
2. Section 01 78 23 – Operations & Maintenance Data

1.2 REQUIREMENTS

A. Except as otherwise specified in the individual Specification sections, guarantee/warranty the Work against defects in materials and workmanship for 12 months from the date of the Substantial Completion Certificate issued by the County.

1. Upon receipt of written notification by the County Representative, guarantee/warranty the Work, or portions thereof, which are used or occupied by the County before final acceptance from the date of beneficial use or occupancy.

B. Comply with the guarantee/warranty requirements as specified in the individual Specification sections.

C. Submit executed guarantees/warranties to the County for review. Deliver them to the County upon Substantial Completion.

D. These warranties shall be in addition to and not a limitation of other rights the County may have under the Contract and which may be prescribed by law, regardless of the wording of manufacturer’s standard warranty.

1.3 SUBMITTAL REQUIREMENTS

A. Refer to Section 01 78 23 for submittal requirements regarding quantity and format.
B. Warranties will be included with Operations and Maintenance manuals, in the hard copy and electronic copy.

1.4 QUALITY ASSURANCE

A. Obtain guarantees/warranties, in duplicate, executed by Contractor and subcontractor or installer responsible for that portion of the Work and countersigned by the manufacturer.

B. Verify that documents are in proper form, contain complete information, and are notarized if warranties are extended beyond the Manufacturers normal warranty period of TWO years.

C. Co-execute submittals when required. Acceptance of manufacturer’s guarantees/warranties by the County shall not be construed to limit the County’s recourse to Contractor for correction of defects under the law and in accordance with the General Conditions.

1.5 WARRANTY CONDITIONS

A. Contractor shall warrant that work performed under this Contract conforms to the Contract Documents and is free of any defect of equipment, material, installation, design furnished, or workmanship furnished by Contractor, or any of its subcontractors or suppliers. SUCH WARRANTY SHALL CONTINUE IN EFFECT FOR 12 MONTHS FROM THE DATE OF APPROVAL OF THE CONTRACTOR'S APPLICATION FOR SUBSTANTIAL COMPLETION BY THE COUNTY except where detailed specifications for certain materials, equipment or systems require longer warranty periods.

B. Warranties are not intended to cover failures which result from the following:
   1. Unusual or abnormal phenomena of the elements.
   2. The County’s misuse, maltreatment, or improper maintenance of the Work.
   3. Insurrection or acts of aggression including war.

C. Promptly after receipt of written notice from the County, remove, replace, or correct Work, or portion thereof, which is damaged or found to be defective and not in accordance with the Contract.
   1. The County may proceed with the correction work at Contractor’s expense if Contractor does not proceed with the corrective work within a reasonable time fixed by written notice from the County, the County may proceed with the work at the expense of the Contractor.
   2. The County reserves the right to remove and store or dispose of defective equipment or material at Contractor’s expense.
   3. If Contractor does not pay the costs of such removal and storage within ten days thereafter, the County may, upon ten additional days written notice, sell such defective items and shall account for the net proceeds after deducting all the costs
that should have been borne by the County, including compensation for County Representative's additional services. If the proceeds from the sale are insufficient to cover all amounts chargeable to Contractor, Contractor shall pay the difference to the County.

1.6 FORM OF GUARANTEE/WARRANTY

D. For equipment or components of equipment put into service for the County’s benefit during the progress of the Work:

(Letterhead of Company)

We (name of Contractor), agree to maintain and repair as recommended by equipment and system manufacturers, any such equipment and systems which have been beneficially used by Marin County personnel prior to the approval of Contractor's Application For Substantial Completion.

Owner: <Department>, County of Marin.

Location of Equipment: <Address>, San Rafael, California.

This guarantee is effective this day of , 20 until the date of County Approval of Contractor's Application for Final Payment.

Signed: (Name of Contractor)

By:

Contractor's Telephone No.____________________________
E. For guarantee/warranty of the entire Work against defects in materials and workmanship for the period of warranty after the Notice of Substantial Completion:

GUARANTEE/WARRANTY FORM

for

<PROJECT NAME>

<CONTRACT NO.>

GUARANTEE/WARRANTY for_______________________________________

We hereby guarantee/warrant that the_______________________________________

which we have provided in the_______________________________________

has been completed in accordance with the requirements of Specification

Section__________and the other Contract Documents.

We agree to repair or replace any or all of our Work, together with any other adjacent Work which may be displaced by so doing, that may prove to be defective in its workmanship or material within a period of 12 months from the date of Substantial Completion of the above named Project; and we also agree to repair any and all damages resulting from such defects, all without any expense to the County, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above mentioned conditions within ten (10) days after being notified in writing by the County, we collectively or separately do hereby authorize the County to proceed to have such defective Work repaired or replaced and made good at our expense, and we will honor and pay the costs and charges therefor upon demand.

Signed________________________________  Date______________________

(Include Contractor's name, address, and license number)

Countersigned__________________________ Date______________________

(County Representative)

Substantial Completion was granted by the County on________________
SECTION 02 41 16
SELECTIVE BUILDING DEMOLITION

PART 1 – GENERAL

1.1 SUMMARY
A. Section Includes: Selective demolition of building elements.
   1. Protect items in place as indicated on the Drawings.
   2. Demolish/remove items as indicated on the Drawings.
   3. Remove/salvage and remove/reinstall items as indicated on the Drawings.
B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 REFERENCES
A. ANSI - American National Standards Institute
   1. A10.6 - Safety Requirements for Demolition Operations.
B. EPA - Environmental Protection Agency
C. NFPA - National Fire Protection Association

1.3 DEFINITIONS
A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner’s property.
B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner’s property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to the Owner’s designated storage area.
C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.
D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
E. Materials Ownership: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner’s property, demolished materials shall become the Contractor’s property and shall be removed from the site with further disposition at the Contractor’s option.

1.4 SUBMITTALS
A. Procedures: In accordance with Division 01.
B. Qualification Data: For demolition firm if not provided by Contractor.
C. Pre-demolition Photographs and Details: Show existing conditions in areas where demolition work will be performed, including finish surfaces, items to be salvaged, and items to be re-installed, that might be misconstrued as damage caused by demolition operations. Submit before work begins.

D. Include photographs of all spaces after removal of ceilings and prior to new work.

E. Inventory of Salvaged Items: After demolition is complete, submit a list of items that have been removed and salvaged.
   1. Include at least one digital photograph of each item, numbered and clearly labeled to correspond with inventory.
   2. Provide written Table of Contents for inventory.
   3. Indicate original location(s) of each item or type of item.
   4. Indicate whether or not the item is to be re-installed. If it will be re-installed, indicate repair or restorative work required and location of re-installation.

F. Demolition, Salvage, and Re-Installation Plan: As specified.

G. Receipts for recycled materials that include name of licensed recycling company, dollar value, and date.

1.5 DEMOLITION, SALVAGE, AND RE-INSTALLATION PLAN

A. Submit a complete Demolition, Salvage, and Re-Installation Plan detailing procedures and sequence for the following:
   1. Removal of existing construction and facilities including all features necessary to remove portions of the existing building for new work in a safe and controlled manner to ensure stability, weather-tightness, and security of the existing building at any given time.
   2. Removal, salvage, transportation, storage, and re-installation of items to be re-installed.
   3. Submit detailed information on methods and sequencing for accomplishing this work. Employ a Structural Engineer registered in the State of California to develop such methods and demolition sequences.
   4. Include plan for maintaining service to the building occupied during construction.

B. Thoroughly investigate the condition of the existing structures before proceeding with the Demolition, Salvage, and Re-Installation Plan.

C. The Demolition, Salvage, and Re-Installation Plan shall consist of the following:
   1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.
   2. Interruption of utility services.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Details and locations of temporary and exterior protective measures to ensure that people, property, and improvements to remain will not be endangered or damaged.
   5. Access routes for hauling debris and salvaged items from building.
   6. Coordinate schedule of activity for hazardous materials removal and other work contracted directly by the Owner.

D. In the event that modifications to the Demolition, Salvage, and Re-Installation Plan are required to be submitted for approval, the Contractor shall provide 14 calendar days for the review of substantial procedural and sequence modifications.

E. Review by the Architect and the Owner of the Demolition, Salvage, and Re-Installation Plan, or field observations performed by the Architect, will in no way relieve the Contractor of full responsibility for the Demolition, Salvage, and Re-Installation Plan and procedure.
1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: A firm with documented specialized experience in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Pre-demolition Conference

1. Conduct conference at Project site. Conference shall be attended by Contractor, the Owner, Architect, demolition contractor if applicable, and others whose work is affected by demolition operations.

2. Pre-demolition photographs and details shall be complete and accepted by Architect before conference takes place.

3. Notify participants a minimum of 48 hours prior to time of conference.

4. Review methods and procedures related to demolition including, but not limited to, the following:
   a. Pre-demolition photographs must be complete and acceptable to Architect and the Owner.
   b. Inspect and discuss condition of construction to be demolished.
   c. Review and finalize Demolition, Salvage, and Re-Installation Plan and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   d. Review and finalize protection requirements.

5. Record discussions of conference and any conflict, incompatibility, or inadequacy. Furnish a copy of record to each participant.

1.7 TRAFFIC

A. Conduct demolition operations and the removal of debris to ensure minimum interference with streets, walks, and adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from the Owner, and, where applicable, from other authorities having jurisdiction.

B. Existing pedestrian walks shall be kept open at all times unless otherwise approved by the Owner. Any closings or disruptions of existing site circulation, if required, shall be included in the Demolition Plan.

C. Full compensation for temporary vehicular and pedestrian controls shall be considered as included in the Contract Lump Sum Price and no additional compensation will be allowed for this purpose.

1.8 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner as far as practical.

B. Coordinate the performance of work in this Section with related or adjacent work.

C. Protection of items should be completed prior to commencement of new construction and demolition procedures. At the end of working day or during inclement weather, cover work exposed to weather with waterproof coverings, securely anchored.
D. Asbestos and lead paint may be encountered in the Work. If any materials suspected of containing asbestos or lead paint are encountered, do not disturb the materials. Immediately notify the Architect and the Owner’s Representative.

PART 2 - PRODUCTS

2.1 PROTECTION MATERIALS

A. Polyethylene Sheets: 4 mil.

B. Lumber: Species to be selected by the Contractor, with sizes to fit field conditions. Lumber shall be fire retardant treated.

C. Plywood: 1/2-inch or 3/4-inch fire retardant treated.

D. Soft Fiberboard
   1. 1/2-inch Homasote.
   2. 1/2-inch NCFR Homasote for exposed locations.

E. Neoprene: 1/4-inch or 1/2-inch strips stock sizes.

F. Polyurethane Foam Sheets: 4-inches thick.


H. Plastic Film Tape: As manufactured by 3M, “Scotch Brand No. 472”; American Biltrite Inc.; Surface Armor, or equal.

I. Kraft Paper.

J. Accessories: Provide necessary and related parts, fasteners, devices and anchors required for complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.

B. Inventory and record the condition of any items required to be removed and salvaged. Where appropriate, provide at least one digital photograph.

C. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Architect and the Owner.

D. Perform an engineering survey of condition of existing buildings to determine whether removing any unanticipated element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
E. Hazardous materials will be remediated by the Owner under separate contract. Coordinate with the Owner's separate contractor, to ensure that hazardous materials are removed or remediated before proceeding with demolition operations in the affected area.

3.2 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities to be removed or abandoned.
   1. Arrange to shut off indicated utilities with the Owner and utility companies when applicable.
   2. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

B. Temporary Shoring: Provide and maintain shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of existing construction.
   1. Strengthen or add new supports when required during progress of demolition.
   2. All work shall be designed by Contractor's Structural Engineer.

C. Comply with the following:
   1. Clean salvaged items of dirt and demolition debris.
   2. Make a written inventory of all salvaged items as specified in Part 1, noting original location, condition, and any significant damage or deficiencies.
   3. Pack or crate items after cleaning. Identify contents of containers and number to correspond with inventory.
   4. Store items in a secure area until re-installation or until delivery to the Owner, as applicable.
   5. Transport items to the Owner or to new location in building as applicable.
   6. Protect items from damage during transport and storage.

3.3 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Clean adjacent site areas of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.4 INSTALLATION OF PROTECTION

A. General
   1. Alternative methods to specified protection may be acceptable if equal or greater protection is provided. Submit alternative methods to the Architect for review as specified. Do not proceed with alternative methods until specified approvals are secured. Mockups may be required.
   2. Protection may be required to remain in place for the duration of the Project. As such, materials shall be installed to provide adequate protection throughout the full extent of construction activities. Repair or reinstall protection as required throughout the duration of construction. Changes to protection shall be proposed to the Architect for approval prior to making changes.
   3. All protection assemblies should be self-supporting and self bracing, and secured at the base, unless otherwise noted.
B. Existing Facilities: Protect adjacent walkways, buildings, and other facilities during demolition operations.

C. Temporary Protection: Comply with requirements in Division 01.

3.5 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.
   4. Maintain adequate ventilation when using cutting torches.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Dispose of demolished items and materials promptly.
   7. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.
   1. Use a pacometer to locate all existing rebar within any existing concrete to be demolished. Before drilling or cutting any rebar, obtain bar-by-bar permission in writing from the Architect.

3.6 SITE RESTORATION

A. Rough grade below-grade areas, where slabs and sidewalks are removed, ready for further excavation or new construction.

B. Completely fill voids resulting from building demolition operations that will not be required by new construction with satisfactory soil materials.

3.7 PATCHING AND REPAIRS

A. Cutting and Patching: As specified in Division 01.

B. All parts of the existing buildings indicated to remain and damaged by demolition operations shall be repaired and refinished or replaced to match existing.

C. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

D. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishning.
E. Repairs to damaged brick joinery may require epoxy injection and re-pointing. Notify Architect of any damage prior to repair.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal
   1. Transport demolished materials off the Owner’s property and legally dispose of them.
   2. When hauling is done over highways or city streets, loads shall be trimmed and the vehicle shelf areas cleaned after each loading.
   3. Contractor shall pay all permit and disposal fees for off-hauled materials.

3.9 CLEANING

A. Sweep the building broom clean on completion of selective demolition operation.

B. All residue and debris from protection work shall be removed from existing construction leaving the premises clean and neat.

3.10 SELECTIVE DEMOLITION SCHEDULE

A. Remove the Following: Demolished site construction materials.

END OF SECTION
SECTION 02 82 13

ASBESTOS and LEAD ABATEMENT / REMEDIATION

PART 1 - GENERAL

1. Project/Work Identification:

   A. General: Project name is County of Marin Exhibit Hall Renovation, located at Avenue of the Flags in San Rafael, CA as shown on Contract Documents prepared by Owner’s Representative, Drawings and Specifications are dated May 2021. This document is intended to supplement a site specific asbestos survey, performed by a qualified and licensed consultant (See Project Manual Section VII).

   B. Abbreviated Written Summary: Briefly and without force and effect upon the contract documents, the work of the Contract can be summarized as follows:

       Abatement of asbestos at roof membranes, roof cements, interior drywall, and acoustic textured ceilings.

   C. General and Administrative Requirements: are set forth in the following specification sections: These sections are found in the CSI master format and may not be used here.

       01 10 00   Summary of the Work
       01 33 00   Submittals
       01 35 16   Alteration Project Procedures
       01 73 29   Cutting and Patching

   D. Definitions and Standards: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon.) Certain terms used in Contract Documents are defined in this article.

   E. Air Monitoring - Consulting & Laboratory Services: Describes air monitoring by Owner so that the building beyond the work area will remain uncontaminated. Air monitoring to determine required respiratory protection is the responsibility of the Contractor.

   F. Decontamination Units: explains the setup and operation of the personnel and material decontamination units.

   G. Respiratory Protection: sets forth the procedures and equipment required for adequate protection against inhalation of airborne asbestos fibers.

   H. Building Demolition - Asbestos Abatement: Not Applicable to this Project

   I. Decontamination of the Work Area: Occurs after completion of abatement work and is described in the final cleaning sections.

   J. Project Closeout: details the closeout procedures to end the project once abatement work is complete including final paperwork requirements.
PART 2 - PLAN OF ACTION

1. Summary

A. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination areas, the sequencing of asbestos work, the interface of trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, and a detailed description of the methods to be employed to control pollution. Expand upon the use of portable HEPA ventilation system, if necessary, closing out of the building's HVAC system, method of removal to prohibit visible emissions in work area, and packaging of removed asbestos debris. The plan must be approved by the Owner's Consultant and Engineer prior to commencement of work.

B. Potential Asbestos Hazard:

1) The disturbance or dislocation of asbestos-containing materials may cause asbestos fibers to be released into the building’s atmosphere, thereby creating a potential health hazard to workmen and building occupants, or adjacent property owners. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures that must be followed.

2) Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

C. Stop Work:

1) If the Engineer or the Owner's Consultant presents a written stop work order then the contractor shall immediately and automatically stop all work and do not recommence work until authorized in writing by Engineer.

D. Contractor Use Of Premises:

1) General: During the entire construction period the Contractor shall have the exclusive use of the premises for construction operations, except as defined in section 019104 “cooperation” of these special provisions.

E. Submittals

1) Before the Start of Work: Submit the following to the Engineer for review. Do not begin work until these submittals are returned with Engineers action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
   a) Plan of Action: Submit as a written report to the Owner's Representative.
   b) Products
   c) Execution
   d) Contingency Plan
PART 3 – SECTION PROJECT COORDINATION - ASBESTOS ABATEMENT

1. Summary

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1) Administrative and Supervisory Personnel.
2) Pre-Construction Conference
3) Daily Log
4) Special Reports.
5) Contingency Plan
6) Notifications.
7) Submittals

B. Administrative and Supervisory Personnel:

1) General Superintendent: Provide a full-time General Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Contractor’s Representative responsible for compliance with all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials.

2) Experience and Training: The General Superintendent must have completed a supervisor’s course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, and have had a minimum of two (2) years on-the-job training in asbestos abatement procedures.

3) Competent Person: The General Superintendent is to be a Competent Person as required by OSHA in 29 CFR 1926.

4) Accreditation: The General Superintendent is to be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C.

C. Pre-Construction Conference:

1) An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by the Engineer prior to start of any work. Meet at project site, or as otherwise directed by the Engineer.

2) 72 hours advance notice will be provided to all participants prior to convening Pre-Construction Conference.
This is an organizational meeting, to review responsibilities and personnel assignments and to locate the containment and decontamination areas and temporary facilities including power, light, water, etc.

D. Daily Log:

1) Daily Log: Maintain on the site a daily log documenting the dates and time of activity but not limited to, the following items:
   a. Meetings; purpose, attendees, brief discussion
   b. Visitations; authorized and unauthorized
   c. Personnel, by name, entering and leaving the work area
   d. Special or unusual events, i.e. barrier breaching, equipment failures, accidents
   e. Air monitoring tests and test results
   f. Documentation of Contractor's completion of the following:
      i. Inspection of work area preparation prior to start of removal and daily thereafter.
      ii. Removal of any sheet plastic barriers or splash guards
      iii. Removal of waste materials from work area
      iv. Contractors final inspection/final air test analysis.

2) Submit copies of this log at final closeout of project as a project close-out submittal.

E. Special Reports:

1) General: Except as otherwise indicated, submit special reports directly to Engineer within one day of occurrence requiring special report, with copy to Engineer and others affected by occurrence.

2) Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures), prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at earliest possible date.

3) Reporting Accidents: Prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

4) Report Discovered Conditions: When an unusual condition of the building is discovered during the work (e.g. leaks, termites, corrosion) prepare and submit a special report indication condition discovered.

F. Contingency Plan:

1) Contingency Plan: Prepare a contingency plan for emergencies including fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this
specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.

2) Post: in clean room of Personnel Decontamination Unit telephone numbers and locations of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company.

G. Notifications

1) Notify other entities at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials, requirements relative to asbestos set forth in these specifications and applicable regulations.

2) Notify emergency service agencies including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations, modifications to fire notification or fire fighting equipment, and other information needed by agencies providing emergency services.

3) Notifications of Emergency: Any individual at the job site may notify emergency service agencies if necessary without effect on this Contract or the Contract Sum.

H. Submittals

1) Before the Start of Work: Submit the following to the Engineer for review. No work shall begin until these submittals are returned with Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
   a) Contingency Plans: for emergency actions.
   b) Telephone Numbers: and location of emergency services.
   c) Post copies of the list in the project meeting room, the temporary field office, and each temporary telephone.
   d) Notifications: sent to other entities at the work site; sent to emergency service agencies; ten day notification sent to Local AQMD; Cal/OSHA Temporary Worksite Notification.
   e) Résumé: of general superintendent.
   f) Accreditation: submit evidence in form of training course certificate of accreditation of General Superintendent as an asbestos abatement supervisor.
   g) Safety Plans: Provide copy of Injury and Illness Prevention Plan and site specific safety plans.
   h) Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
   i) Registrations, etc.: Licenses, Cal/OSHA registration, worker training, worker medical certificates, and Material Safety Data Sheets (MSDS) for any materials used on the site.

2. Products (Not Applicable)

3. Execution (Non-Applicable)
1. Summary

A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon.) Certain terms used in Contract Documents are defined in this article.

B. General Requirements: The provisions or requirements of Division-1 sections apply to entire work of Contract and, where so indicated, to other elements which are included in project.

2. Definitions:

A. General: Definitions contained in this Article are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Documents.

B. Regulation: The term "Regulations" includes laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work, whether they are lawfully imposed by authorities having jurisdiction or not.

C. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests.

D. Owner's Representative: This is the entity described as the "Architect" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." All references to Architect or Engineer in the Contract Documents in all cases refer to the Owner's Representative. The Owner's Representative will represent the Owner during construction and until final payment is due. The Owner's Representative will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Owner's Representative.

E. Project Administrator: This is the entity described as the "Project Representative" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon verbal order if requirements of the Contract Documents are not met, or if in the sole judgement of the Project Administrator, Owner's Representative, Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.

F. General Superintendent: This is the Contractor's Representative at the work site. This person will generally be the Competent Person required by OSHA in 29 CFR 1926.

3. Definitions Relative To Asbestos Abatement:
A. Accredited or Accreditation (when referring to a person or laboratory): A person or laboratory accredited in accordance with section 206 of Title II of the Toxic Substances Control Act (TSCA).

B. Aerosol: A system consisting of particles, solid or liquid, suspended in air.

C. Air Cell: Insulation normally used on pipes and duct work that is comprised of corrugated cardboard which is frequently comprised of asbestos combined with cellulose or refractory binders.

D. Air Monitoring: The process of measuring the fiber content of a specific volume of air.

E. Amended Water: Water to which a surfactant has been added to decrease the surface tension to 35 or less dynes. A mixture of surfactant and water which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a solution of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

F. Asbestos: The asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.

G. Asbestos-Containing Material (ACM): Any material containing more than 0.1% by weight of asbestos of any type or mixture of types.

H. Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.

I. Asbestos-Containing Waste Material: Any material which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.

J. Asbestos debris: Pieces of ACBM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM.

K. Authorized Visitor: The Owner, the Owner’s Representative, Consultants, testing lab personnel, the Architect/Engineer, emergency personnel or a representative of any federal, state and local regulatory or other agency having authority over the project.

L. Barrier: Any surface that seals off the work area to inhibit the movement of fibers.

M. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

N. Certified Asbestos Consultant (CAC): An individual currently certified as an Asbestos Consultant by the California Division of Occupational Safety and Health (CAL/OSHA) pursuant to Sections 7180 et seq. of the business and Professions Code.
O. Ceiling Concentration: The concentration of an airborne substance that shall not be exceeded.

P. Certified Industrial Hygienist (C.I.H.): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

Q. Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.

R. Disposal Bag: A properly labeled 6 mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site.

S. Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.

T. Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.

U. Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.

V. Removal encapsulant: a penetrating encapsulant specifically designed to minimize fiber release during removal of asbestos-containing materials rather that for in situ encapsulation.

W. Encapsulation: Treatment of asbestos-containing materials, with an encapsulant.

X. Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.

Y. Filter: A media component used in respirators to remove solid or liquid particles from the inspired air.

Z. Friable Asbestos Material: Material that contains more than 1.0% asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

AA. HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in diameter.

BB. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

CC. High-efficiency particulate air filter: (HEPA) refers to a filtering system capable of trapping and retaining 99.97 percent of all monodispersed particles 0.3 um in diameter or larger.

DD. Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

EE. Negative Pressure Ventilation System: A pressure differential and ventilation system.
FF. Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.

GG. Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the Work Area at a lower pressure than any adjacent area, and which cleans recirculated air or generates a constant air flow from adjacent areas into the Work Area.

HH. Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

II. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.

JJ. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

KK. Time Weighted Average (TWA): The average concentration of a contaminant in air during a specific time period.

LL. Visible Emissions: Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

MM. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.

NN. Work Area: The area where asbestos-related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

4. Products (Not Applicable)

5. Execution (Not Applicable)

PART 5 - SECTION AIR MONITORING - CONSULTING & LABORATORY SERVICES

1. Description of the work

A. Not in Contract Sum: This section describes work being performed by the County. This work is not in the Contract Sum.

B. A Certified Asbestos Consultant will provide oversight and monitoring services during the project. Work practices of the contractor will be monitored to verify compliance with Local AQMD, Cal/OSHA and EPA regulations. Air samples will be taken during the project in the adjacent occupied work spaces. At the completion of the job, final air samples will be collected from the abatement areas as well as the adjoining
spaces. Clearance air sampling will use aggressive methods and Transmission Electron Microscopy (TEM) analysis.

C. A thorough visual inspection will be completed before the final air sampling.

D. This section describes air monitoring carried out by the owner to verify that the building beyond the work area and the outside environment remains uncontaminated. This section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.

E. Personal air monitoring required by Cal/OSHA is work of the Contractor and is not covered in this section.

2. Air monitoring

A. Work Area Isolation: The purpose of the Owner's air monitoring is to detect faults in the work area isolation such as:

B. Contamination of the building outside of the work area with airborne asbestos fibers,

C. Failure of filtration or rupture in the differential pressure system.

D. Contamination of air outside the building envelope by airborne asbestos fibers.

E. Should any of the above occur immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Owner's Representative.

F. Work Area Airborne Fiber Count: The Owner will monitor airborne fiber counts in the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

G. Work area clearance: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to an acceptable level, the Owner will sample and analyze air by Transmission Electron Microscopy.

H. The Owner will be conducting air monitoring throughout the course of the project.

3. Analytical methods:

A. The following methods will be used by the Owner in analyzing filters used to collect air samples.

B. Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.

C. Transmission Electron Microscopy will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

4. Before Start of Work:
A. The County will secure Air Samples to establish a base line before start of work. Samples will be analyzed by PCM.

5. Daily:
   A. From start of work, the County may be taking samples on a daily basis. Samples will be analyzed by PCM.
   B. Additional samples may be taken at County or County's Representatives discretion. If airborne fiber counts are encountered, additional samples will be taken as necessary to monitor fiber levels.

6. Clearance Air Sampling:
   A. Aggressive clearance air samples will be analyzed by Transmission Electron Microscopy (TEM).

7. Consulting and Laboratory Testing:
   A. The services of a Certified Asbestos Consultant (CAC) and a testing laboratory may be employed by the County to collect and perform laboratory analyses of the air samples. A CAC will be at the job site, and samples will be sent daily to the laboratory for next day delivery, so that verbal reports on air samples can be obtained within 24 hours. The Contractor will have access to all air monitoring tests and results.

8. Products (Not Applicable)

9. Execution

10. Additional Testing:
   A. The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the County.
   B. Personal Monitoring: This is the sole responsibility of the contractor.
   C. County will not be performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose.

PART 6 - SECTION RESPIRATORY PROTECTION

1. Description Of Work:
   A. Instruct and train each worker involved in asbestos abatement or maintenance and repair of friable asbestos-containing materials in proper respiratory use and require that each worker always wear a respirator, properly fitted on the face in the Work Area from the start of any operation which may cause airborne asbestos fibers until the Work Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

2. Standards:
A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.


C. CAL/OSHA California Division of Occupational Safety and Health, General Industry Safety Orders, Title 8, Section 5144 and Construction Safety Orders, Title 8, Section 1531.


E. NIOSH - National Institute for Occupational Safety and Health

F. MSHA - Mine Safety and Health Administration

3 Submittals:

A. Before Start of Work submit the following to the Engineer for review. Do not begin work until these submittals are returned with the Engineer’s action stamp indicating that the submittal is returned for unrestricted use.

B. Product Data: Submit manufacturer's product information for each component used, including NIOSH and MSHA Certifications for each component in an assembly and/or for entire assembly.

C. Respiratory Protection Program: Submit Contractor's written respiratory protection program manual as required by OSHA 1926.58 and CAL/OSHA Section 1531.

D. Respiratory Protection Schedule: Submit level of respiratory protection intended for each operation required by the project.

4 Equipment: Air Purifying Respirators

A. Respirator Bodies: Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit.

B. Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2 (1980). In addition, a chemical cartridge section may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.

C. Non-permitted respirators Do not use single use, disposable or quarter face respirators.
5 Execution:


B. Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental.

C. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers.

D. Regardless of Airborne Fiber Levels: Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.

E. Do not allow the use of single-use, disposable, or quarter-face respirators for any purpose.

PART 6.1 - SECTION: DECONTAMINATION UNITS

1. Description Of Work:

A. Provide separate Personnel Decontamination facility and Load Out Area. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Load Out Area.

B. Submittals:

1) Before the Start of Work: Submit the following to the Owner's Representative for review. Do not begin work until these submittals are returned with Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
   a) Personnel Decontamination Unit: Provide shop drawing showing location and assembly of personnel decontamination units.

C. Products: Decontamination Units

1) Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 4.0 or 6.0 mil thick as indicated, clear, frosted, or black as indicated.

2) Duct Tape: Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

3) Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

4) Filters: Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that
discharged water passes primary filter and output of primary filter passes through secondary filter.
  a) Primary Filter - Passes particles 20 microns and smaller
  b) Secondary Filter - Passes particles 5 microns and smaller

PART 6.2 – EXECUTION : DECONTAMINATION UNITS

1. Personnel Decontamination Unit:
   
   A. Changing Room (clean room): Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.
      
      1) Construct using polyethylene sheeting, at least 6 mil in thickness, to provide an airtight seal between the Changing Room and the rest of the building.
      
      2) Locate so that access to Work Area from Changing Room is through regulated work area entrance.
      
      3) Separate Changing Room from the building by a sheet plastic flapped doorway.
      
      4) Require workers to remove all street clothes in this room, dress in clean, disposable coveralls, and don respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require Workers to enter this room either from outside the structure dressed in street clothes, or exiting from the decontamination area.
      
      5) Maintain floor of changing room dry and clean at all times. Do not allow work site debris or water to soil floor in changing room.
      
      6) Provide posted information for all emergency phone numbers and procedures.

   B. Drying Room: Provide a drying room as an airlock and a place for workers to dry after showering (if applicable).
      
      1) Separate this room from the rest of the building with airtight walls fabricated of 6 mil polyethylene.
      
      2) Separate from Regulated work area from the remainder of the store by a sheet plastic flapped doorway.
      
      3) Provide a continuously adequate supply of disposable bath towels.

   C. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.
      
      1) Separate this room from the Work Area by a 6 mil polyethylene flapped doorway.
      
      2) Separate this room from the rest of the building with airtight walls fabricated of 6 mil polyethylene.
      
      3) Separate this room from the Decontamination Room and Work Area with airtight walls fabricated of 6 mil polyethylene.
4) Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

D. Airlock: Provide an airlock between Equipment Room and Work Area. This is a transit area for workers.

1) Separate this room from Equipment Room and Work Area by a sheet plastic flapped doorways.

2) Separate this room from the rest of the building with airtight walls fabricated of 6 mil polyethylene.

3) Separate this room from the Equipment Room and Work Area with airtight walls fabricated of 6 mil polyethylene.

E. Work Area: Separate Work Area from the Equipment Room by polyethylene barriers. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil polyethylene per shift change and remove contaminated layer after each shift.

F. Decontamination Sequence: Require that all workers adhere to the following sequence when entering or leaving the Work Area.

1) Entering Work Area: Worker enters Changing Room and removes street clothing, puts on clean disposable overalls and respirator, and passes through the Decontamination Room into the Equipment Room.

2) Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.

3) Worker proceeds to Work Area.

G. Exiting Work Area:

1) Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet.

2) The worker then proceeds to the Equipment Room and removes all protective clothing except respiratory protection equipment.

3) Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Equipment Room.

4) Disposable coveralls are placed in a bag for disposal with other material.

5) After removal of contaminated protective clothing, the worker moves to the Showers (if applicable) or Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.
H. Load-out Area: The load-out area is the transfer area from the building to a truck or dumpster. It may be the Clean Room of the Equipment Decontamination unit or a separate room or loading dock area.

I. Construction Of The Decontamination Units:

1) Walls and Ceiling: Construct airtight walls and ceiling using polyethylene sheeting, at least 6 mil in thickness. Attach to existing building components or a temporary framework.

2) Floors: Use 2 layers (minimum) of 6 mil polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.

3) Flap Doors: Fabricated from three (3) overlapping sheets with openings a minimum of three feet (3') wide. Configure so that sheeting overlaps adjacent surfaces. Weight sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') between entrance and exit of any room. Provide a minimum of three feet (3') between doors to airlocks.

4) Visual Barrier: Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/4 inch thick hardboard or 1/2 inch plywood. Where the solid barrier is provided, sheeting need not be opaque.

5) Alternate methods of providing Decontamination facilities may be submitted to the Engineer for approval. Do not proceed with any such method(s) without written authorization of the Engineer.

J. Cleaning Of Decontamination Units:

1) Clean debris and residue from inside of Decontamination Units on a daily basis. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

2) If the Changing Room of the Personnel Decontamination Unit becomes contaminated with asbestos-containing debris, abandon the entire Decontamination Unit and erect a new Decontamination Unit. Use the former Changing Room as an inner section of the new Equipment Room.

K. Signs:

1) Provide signs in both English and Spanish.
A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1) Inspection procedures.

2) Project record document submittal.

B. Inspection Procedures: Upon completion of all abatement activities, the consultant and the General Superintendent from the abatement contractor shall review all work and perform a complete walk through of the facility. Work logs, employee sign in sheets, negative pressure manometer logs, manifests, etc. will be provided for the clients’ records at this point.

C. Any remaining clearance inspections will take place at this point. Clearance inspections may consist of visual, wipe samples, or air samples.

D. Air sample clearances shall be performed using Transmission Electron Microscopy (TEM), unless background debris or other site conditions will overload air sampling cassettes. Acceptable clearance level is 70 structures/mm² for TEM.

E. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

F. Upon completion of the work, submit record Specifications to the Engineer for the County's records.

G. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Engineer for the County's records.

2. Products (Not Applicable)

3. Execution (Not Applicable)

PART 8 - SECTION BUILDING DEMOLITION-ASBESTOS ABATEMENT

1. Description Of The Work

A. The work of this Section includes the demolition of buildings and installations where asbestos containing materials are present.

B. Submittals:

1) Before Start of Work: Submit the following to the Owner's Representative for review. Do not start work until these submittals are returned with Owner's
Representative’s action stamp indicating that the submittal is returned for unrestricted use.

2) Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

3) Safety Data Sheet: Submit the Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for each surfactant and encapsulating material proposed for use on the work. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

2. Products:

A. Wetting Materials: For wetting prior to disturbance of asbestos-containing materials use amended water

B. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

C. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 4.0 or 6.0 mil thick as indicated, clear, frosted, or fire retardant as indicated.

D. Duct Tape: Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

E. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

F. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled as required by Section 02084 Disposal of Asbestos Containing Waste Material.

G. Fiberboard Drums: Provide heavy duty leak tight fiberboard drums with tight sealing locking metal tops.

3 Execution

A. Worker Protection:

1) Before beginning work with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

2) If excessive airborne dust levels are noted, the consultant will collect area air samples at downwind locations from the work. Visible emissions of dust will be sufficient to shut down all work on the project, until additional wetting has taken place.
3) During the renovation / demolition of the building, it is possible that previously hidden materials may be discovered. Any suspect materials that are uncovered, shall be basis for immediate cessation of further work. The suspect materials shall be brought to the attention of the consultant for determination of content or hazard.

4) At the completion of all demolition and waste disposal the consultant shall perform a final site visit to verify that no visible asbestos debris remains at the site.

5) Final Air Testing: If the Work Area is to be occupied prior to application of new materials clear the Work Area in accordance with requirements of sections regarding Work Area Clearance.

4. Removal Of Asbestos-Containing Materials

A. General

1) Related Work Specified Elsewhere:

B. Disposal of asbestos-containing waste is specified in Section Disposal of Asbestos-Containing Waste Material.

C. Isolation of Work Areas, Interior of Building

1) Install critical barriers and regulated area signage.

2) Set up containment or splash guards. The containment / splash guards for abatement spaces shall consist of 6 mil flame resistant poly, 1 wall and ceiling layer, extending at least 6 feet above floor level, adjacent to all ACM floors.

3) Connect Temporary Services (GFI Power, water, lights)

4) Erect Notification Board and Warning Signs

5) Lockout Electrical Equipment (work areas only)

6) Establish/ Maintain Regulated Work Area.

D. Removal of Asbestos Containing Flooring Materials, Friable.
This specification section is not applicable to this project.

E. Removal of Asbestos Containing Flooring Materials, Non-Friable.
This specification section is not applicable to this project.

F. Removal of Asbestos Containing Thermal System Insulation, Friable
This specification section is not applicable to this project.

G. Removal of Asbestos Containing Surfacing Materials, Friable
This specification section is not applicable to this project.

H. Removal of Asbestos Containing Roofing Materials, Non-Friable.
This specification section is not applicable to this project.

I. Removal of Asbestos Containing Plasters and Stuccos, Non-Friable
This specification section is not applicable to this project.

J. Removal of Asbestos Containing Transite Materials, Non-Friable
This specification section is not applicable to this project.

K. Removal of Asbestos Containing Caulkings and Sealants, Non-Friable
This specification section is not applicable to this project.

L. Removal of Asbestos Containing Drywall Materials, More than 1% Asbestos

1) This portion of the project (if applicable) will consist of removal of the drywall materials such as gypsum board, joint tape and applied texture wall or ceiling coatings. These areas are identified as such in an inspection or asbestos survey. The soft surface materials are considered friable when disturbed and will require specific handling practices to prevent release of fibers. Removal of the other non-friable materials is covered in later sections.

2) Use of appropriate personnel protective equipment (PPE) for removal of friable asbestos is required for all personnel performing any aspect of this project.

3) Install critical barriers and containment consisting of multiple layers of 6 mil polyethylene sheeting, to produce a negative pressure enclosure. The containment shall be capable of maintaining 0.25 " WC negative pressure, by means of multiple negative air machines. Whichever system is selected shall be listed in the Injury and Illness Prevention Plan of the contractor and be submitted as part of the submittal package.

4) Establish a decontamination unit as the sole means of entrance and exit from the regulated work space.

5) Remove the drywall materials using scrapers and scrubbing pads, performing all work "wet" using amended water.

6) Remove the drywall intact if possible, removing large pieces in manageable sections for placement into 6 mil poly disposition bags. The drywall shall be removed down to the bare wall studs, joists, or substrate material. The remaining surface shall be left clean and free of any three dimensional materials. The contractor has the option of wet scrubbing and using a HEPA vacuum on the contaminated surface.

7) Wrap all Waste in double 6 mil bags with appropriate warning labels on bags, as required by current federal, state, and local regulations.

8) Notify consultant that work space is ready for final visual inspection. Foreman to be available for assistance if additional materials are discovered.

9) Encapsulate all surfaces and areas where ACM was removed, using penetrating encapsulant. Alternatively rinse the surface with water / detergent prior to application of new flooring materials.

10) The work area shall be HEPA vacuumed of any residual materials prior to removal of regulated area barriers or containment.

M. Removal of Asbestos Containing Drywall Materials, Less than 1% Asbestos
This specification section is not applicable to this project.
N. Removal of Polychlorinated Biphenols (PCB) Ballasts & Lamps
   This specification section is not applicable to this project.

PART 9 - SECTION BUILDING DEMOLITION-LEAD BASED PAINT ABATEMENT

1. Description Of The Work: The paints are in good condition and do not require lead specific abatement at this time. If the scope of work includes welding on steel beams or painted components, the contractor shall submit supplemental lead specific work plans for review by the County of Marin. In general, prior to any trigger task activity, the lead containing or lead based paint must be remediated in compliance with CA DPH and Cal / OSHA Lead in Construction regulations.

A. The work of this Section includes the demolition of buildings and installations where lead based or lead containing paints are present.

B. Submittals:

1) Before Start of Work: Submit the following to the Engineer or Owner's Representative for review. Do not start work until these submittals are returned with Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use.

2) Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

3) Safety Data Sheet: Submit the Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for each surfactant and encapsulating material proposed for use on the work. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

C. Abatement of Lead Based Paints
   This specification section is not applicable to this project, unless the scope of work changes.

END OF SECTION
PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Available Information: Existing drawings, dated July 30, 1974, by Taliesin Associated Architects of the Frank Lloyd Wright Foundation is available in accordance with "Information Available to Bidders".

1.2 SUMMARY

A. This Section includes:
   1. Reinforcing bar dowels installed in hardened concrete using adhesive prepackaged in cartridges.
   2. Reinforcing bar dowels and threaded bar anchors installed in hardened concrete using nonshrink grout.

B. Related Sections:
   1. Section 05 05 25 – Post-Installed Concrete Anchors for installation of adhesive anchors for attachment of nonstructural and structural components.

1.3 REFERENCES

A. Standards listed below apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

B. ASTM: Standards of the American Society for Testing and Materials (ASTM) apply where designated in this Section.


D. ICC-ES: ICC Evaluation Service:

1.4 SUBMITTALS

A. Submittal procedures and administrative provisions are established by Division 01 Section "Submittal Procedures".

B. Product data for proprietary materials, including epoxy adhesives and nonshrink grout. Include manufacturer’s detailed instructions for storage and handling, installation, and special inspection.
   1. Include current ICC Evaluation Service Report for adhesives prepackaged in cartridges.
1.5 QUALITY ASSURANCE

A. Cartridge Adhesive: Products proposed for use shall have an active ICC Evaluation Service Report evidencing compliance with ICC ES acceptance criteria AC308 for use to resist tension and shear in cracked and uncracked concrete.
   1. Installation shall conform to manufacturer's written instructions listed in ICC ES report.

PART 2 – PRODUCTS

2.1 ADHESIVE AND GROUT MATERIALS

A. Cartridge Adhesive
   1. Epoxy Adhesive: Two-component, 100% solids, structural epoxy conforming to ASTM C881, Type IV; Grade 3; prepackaged in cartridges for manually or pneumatically operated caulk gun and automatically mixed at nozzle. Approved for use in cracked and uncracked concrete in accordance with ICC ES AC308, as demonstrated by an active ICC Evaluation Service Report. Subject to compliance with specified requirements, provide one of the following, or equal:
      HIT-RE 500-V3 Adhesive, Hilti Inc.
      Set-3G Epoxy Adhesive, Simpson Strong-Tie Co.
      Pure 110+, Dewalt\Powers
      Epcon G5 Adhesive, by ITW Red Head
   2. Hybrid Adhesive: Two-component, hybrid adhesive prepackaged in cartridges for manually or pneumatically operated caulk gun and automatically mixed at nozzle. Approved for use in cracked and uncracked concrete in accordance with ICC ES AC308, as demonstrated by an active ICC or IAPMO Evaluation Service Report. Subject to compliance with specified requirements, provide one of the following, or equal:
      HIT-HY 200 Adhesive, Hilti Inc.
      AT-XP Adhesive, Simpson Strong-Tie Co.
      AC200+, DeWalt\Powers

B. Nonshrink Grout: Premixed, nonmetallic, noncorrosive product, complying with ASTM C1107, Class B or C, at fluid consistency. Non-bleeding after mixing at a 27 (plus or minus 3 second) flow, ASTM C939, at 45 to 90 degrees F. Will pass through flow cone 45 minutes after initial mixing without the addition of water. Subject to compliance with requirements, provide one of the following:
      Euco N.S., Euclid Chemical Co.
      Masterflow 928, Master Builders
      Five Star Grout, U.S. Grout Corp.

2.2 DOWELS

A. Reinforcing Bars: ASTM A615, Grade 60, or ASTM A706, deformed. Embedded end shall be free of offsets that interfere with installation.
PART 3 – EXECUTION

3.1 EXAMINATION

A. Employ drilling methods that comply with OSHA Code of Federal Regulations Title 29 section 1926.1153, Respirable Crystalline Silica, Table 1. Reference https://www.osha.gov/Publications/OSHA3681.pdf for more information.

B. Examine areas to be drilled to verify conditions of access, interferences, and existing materials.

C. Locate existing reinforcing steel, which might interfere with drilling, with a suitable metal detector or by chipping.

3.2 PREPARATION

A. Protect existing exposed surfaces from grouting operations.

B. Dowels shall be free of oil, mud, loose rust or other materials that may reduce bond.

3.3 INSTALLATION WITH CARTRIDGE ADHESIVE

A. General:

1. Install anchors in accordance with manufacturer’s written instructions, including drilling, hole cleaning, dispensing of epoxy and setting of dowels.

B. Adhesive Type: Approved hybrid adhesives shall be acceptable where designated embedment depth is 12 inches or less. Hybrid adhesives shall not be acceptable for dowels with deeper embedment; use epoxy adhesive.

C. Drilling:

1. Drilling Equipment: Use electric or pneumatic rotary type drilling hammer with medium or light impact and carbide tipped masonry bit. Where edge distances are less than 2 inches clear, use lighter impact equipment to prevent microcracking during drilling process.
2. Do not cut reinforcing steel, except with approval of Owner’s Representative. Where reinforcing is encountered, drill new hole a minimum of 2 diameters clear at no additional cost to Owner.

D. At overhead applications, use manufacturers standard hole plug to prevent epoxy leakage and temporarily support dowel to prevent movement out of hole. Hybrid adhesive is preferred for overhead application, where embedment depth permits use.

E. Fill abandoned holes with nonshrink grout.

3.4 INSTALLATION WITH NONSHRINK GROUT

A. Drill holes to a diameter 1-inch minimum larger than the nominal diameter of the dowels.

B. Drill holes using water-cooled core drilling equipment. Roughen surface by method acceptable to Owner’s Representative.

C. Clean hole by flushing with water hose inserted to back of hole until water runs clear, brush twice with round steel wire bristle brush of appropriate diameter, and flush with hose until water runs clear.
D. Place reinforcing bar into hole. Provide centralizing devices as required to maintain bar at center of core.

E. Mix and place grout at fluid consistency in accordance with manufacturer’s recommendations.

F. Cure by covering with wet cloth for 3 days minimum or by coating with curing compound.

3.5 CLEANING

A. Clean excess epoxy from around holes before it hardens only on surfaces that will not be exposed to view.

B. On surfaces that will be exposed to view, allow epoxy to cure then chip away hardened epoxy. Surfaces shall be repaired to match existing finish to the satisfaction of the Owner's Representative.

3.6 PROTECTION

A. Protect dowels from accidental disturbance during setting time specified by manufacturer.

B. Do not place pull-out or shear loads on dowels during curing time specified by manufacturer.

3.7 FIELD QUALITY CONTROL

A. Inspection and testing will be performed in accordance with procedures and administrative requirements of Division 01 Section, "Quality".

B. Testing Laboratory will:
   1. Review manufacturer's recommended installation and inspection procedures, as contained in ICC Evaluation Service Report.
   2. Special Inspect installation for conformance with Contract Documents, manufacturer’s recommendations, and requirements of the applicable ICC-ES report.
   3. Proof test a random sample of dowels in accordance with the following requirements, except where Drawings designate that no proof testing is required.
      a. Frequency: Two test dowels shall be randomly selected by Testing Laboratory from each group for each day's placement. A group shall consist of dowels of the same size, embedment and orientation, and installed by the same personnel.
      b. Testing Procedure: Hydraulic ram tension testing for bond, confined configuration; in accordance with ICC-ES AC308. Testing shall be performed following wait period recommended by adhesive manufacturer.
      c. Test Load: As designated on Drawings.
      d. Acceptance Criteria: No discernible movement of dowel out of hole while maintaining the test load for 15 seconds minimum.
      e. Failure of one dowel shall constitute rejection of that group of dowels until additional testing is performed and accepted by the Owner's Representative. The testing frequency for group shall be increased to 25 percent, but not less than five dowels. In the event of additional failures, the Group shall be rejected and the cause of failure shall be investigated.

END OF SECTION
SECTION 03 62 00
GROUTED DOWELS IN MASONRY

PART 1 – GENERAL

1.1 SUMMARY
A. Section Includes
   1. Reinforcing bar dowels and threaded bar anchors installed in masonry walls using epoxy adhesives.
   2. Reinforcing bar dowels installed in masonry using non-shrink grout.
B. Related Section
   1. Section 03 61 00 - Grouted Dowels in Concrete.

1.2 REFERENCES
A. Standards listed below apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.
B. ASTM : American Society for Testing and Materials

1.3 SUBMITTALS
A. Submittal procedures and administrative provisions are established by Division 01 Section "Submittal Procedures".
B. Product data for proprietary materials, including epoxy adhesives and nonshrink grout. Include manufacturer’s detailed instructions for storage and handling, installation, and special inspection.
   1. Include current ICC Evaluation Report for epoxy adhesives prepackaged in cartridges.

1.4 QUALITY ASSURANCE
A. Qualifications for Grouting Contractor and Field Personnel:
   1. Dowels Installed with Epoxy: Field personnel shall have prior experience installing anchors in unreinforced masonry using screen tubes and similar epoxy adhesives.
   2. Dowels Installed with Non-shrink Grout: Manufacturer’s representative shall conduct job site training for field personnel to ensure proper mixing, handling and installation.
B. Preconstruction Meeting:
1. Prior to undertaking the work, the grouted dowel installation subcontractor shall meet at the jobsite with Owner's Representative, and Special Inspector to review proposed installation procedures, and testing and inspection requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Epoxy Adhesive: Nonsag light paste, two-component epoxy, prepackaged in cartridges for caulk gun or pneumatic tool and automatically mixed at nozzle. Capable of bonding to damp surfaces. ICC approved (active) for installation in masonry walls. Subject to compliance with requirements provide one of the following, or equal:
   1. For use at masonry:
      SET Adhesive, Simpson Strong Tie Co.
      HIT-HY 20 Adhesive, Hilti Inc.

B. Nonshrink Grout: Premixed, nonmetallic, noncorrosive product, complying with ASTM C1107, Class B, at fluid consistency. Non-bleeding after mixing at a 27-plus or minus 3 second flow, ASTM C939, at 45 to 90 degrees F. Will pass through flow cone 45 minutes after initial mixing without the addition of water.
   Subject to compliance with requirements, provide one of the following:
   Euco N.S., Euclid Chemical Co.
   Masterflow 555, Master Builders.
   Five Star Grout, U.S. Grout Corp.

C. Threaded Rods: ASTM A36 all-thread rod; solvent cleaned to remove cutting oil.
   1. Provide hot dip galvanized or stainless steel rods and nuts where indicated on Drawings.

D. Reinforcing Bars: Grade 60, deformed. Grind end of bar to remove offsets.


F. Bolts: Hot dipped galvanized ASTM A307 headed bolts for through bolts at building exterior.


PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to be drilled to verify conditions of access, interferences, and existing materials.

B. Locate existing reinforcing steel, which might interfere with drilling, with a suitable metal detector.

3.2 PREPARATION

A. Protect existing exposed surfaces from grouting operations.

B. Dowels shall be free of oil, mud, loose rust or other materials that may reduce bond.
3.3 INSTALLATION IN BRICK WALLS WITH EPOXY

A. Drilling:
   1. Drilling Equipment: Use rotary type drill or roto-hammer and carbide tipped masonry bit.
   2. Conform to ICC Evaluation Service Report for hole diameter. Conform to Drawings for hole depth and angle.

B. Clean hole by brushing with a nylon brush and by blowing out with oil-free high pressure air jet.

C. Select diameter based on ICC Evaluation Service Report.
   1. Where hole is drilled through wood or steel member, fill oversize hole in member with epoxy.

D. Insert dowel slowly into epoxy filled hole, rotating dowel to remove trapped air.

3.4 INSTALLATION WITH NONSHRINK GROUT

A. Drill holes using core drilling equipment.
   1. Hole Diameter: Drill holes to a diameter 1 inch larger than the nominal diameter of the dowel, except where a larger diameter is shown on Drawings or is required for placement at long embedment depths.
   2. Embedment Depth: Install to depth shown on Drawings. Where not shown, base bid on depth of 20 dowel diameters and verify depth with Owner’s Representative prior to installation.

B. Clean hole by brushing with a nylon brush and by blowing out with oil-free high pressure air jet.

C. Saturate surface 24 hours prior to grouting with potable water. Remove free water immediately before grouting.

D. Place reinforcing bar into hole. Provide centralizing devices as required to maintain bar at center of core.

E. Mix and place grout at fluid consistency in accordance with manufacturer’s recommendations.

F. Cure by covering with wet cloth for 3 days minimum or by coating with curing compound.

3.5 CLEANING

A. Clean excess epoxy and nonshrink grout from around holes before it hardens only on surfaces that will not be exposed to view.

B. On surfaces that will be exposed to view, allow epoxy to cure then chip away hardened epoxy. Surfaces shall be repaired to match existing finish to the satisfaction of the Owner’s Representative at no additional cost to the Owner.
   1. Wet-Cored Holes in Masonry: Staining of exposed masonry surfaces caused by cooling water associated with drilling shall be cleaned immediately following drilling and saturation of hole.

3.6 PROTECTION

A. Protect dowels from accidental disturbance during curing time specified by manufacturer or for 24 hours minimum, whichever is greater.

B. Do not place pull-out or shear loads on dowels for minimum three days after grouting.
3.7 FIELD QUALITY CONTROL

A. Inspection and testing will be performed in accordance with procedures and administrative requirements of Division 01 Section, "Quality Requirements".

B. Testing Laboratory will:
   1. Review manufacturer's recommended installation and inspection procedures.
   3. Test reinforcing bar and threaded dowels installed in masonry, to loads indicated on Drawings. Maintain load for a minimum of 5 minutes. There shall be no loosening or movement of dowel out of hole and no cracking of masonry in which dowel or bolt is set.
      a. Test a minimum of 10 percent of each size dowel.
      b. Test a minimum of 3 of each size dowel.
      c. Perform tests at different locations and conditions to obtain representative sample.
      d. Should any dowel or bolt fail to meet this criterion, increase testing of similar dowels by 100 percent. If other failures occur during additional testing, test all similar dowels.

C. Contractor shall pay for increased testing caused by dowel failures.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section Includes:
   1. Post-installed mechanical anchors in concrete, including:
      a. Wedge-type expansion anchors approved for use for seismic applications in cracked and uncracked concrete.
      b. Screw-type drilled-in anchors approved for use for seismic applications in cracked and uncracked concrete.
   2. Post-installed adhesive anchors in concrete, approved for use for seismic applications in cracked and uncracked concrete.

C. Related Sections:
   1. Section 03 61 00 – Grouted Dowels: For reinforcing bar dowels installed in hardened concrete using adhesive.

1.2 REFERENCES


1.3 DEFINITIONS

A. Nominal Embedment Depth: Minimum length from concrete surface to end of anchor following completion of anchor installation. For wedge-type anchors, nominal embedment depth shall be measured following application of installation torque.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Division 01, “Submittal Procedures”.
   1. Manufacturer’s product data.
   2. Manufacturer’s installation instructions.
   3. ICC-ES or IAPMO-ES Evaluation Reports.

1.5 QUALITY ASSURANCE

A. Certifications: Anchors shall have an active ICC-ES or IAPMO-ES Evaluation Report in accordance with the following ICC-ES Acceptance Criteria:
   1. Mechanical Anchors in Concrete: Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC 193).
PART 2 – PRODUCTS

2.1 MECHANICAL ANCHORS

A. General: Anchors shall be tested and approved for use in cracked and uncracked concrete in accordance with ICC-ES AC 193.
   1. Anchors installed through underside of steel deck shall be tested and approved for installation through the soffit of concrete-filled metal deck assemblies in accordance with ICC-ES AC 193.
   2. Anchors used for resistance to seismic forces shall be qualified in accordance to ACI 355.2 for mechanical anchors and ACI 355.4 for adhesive anchors.

B. Acceptable Products: Where anchor manufacturer and product are indicated on Drawings, provide designated product.
   1. Contractor shall be allowed to substitute products of other manufacturer's, subject to demonstrating equivalent tension and shear strength to specified anchor, under project installation conditions.
   2. Where anchor design is prepared by Trade Subcontractor's Engineer, use product designated by Trade Subcontractor's Engineer, subject to meeting requirements of this Section.

C. Wedge Anchors: Wedge type, torque-controlled expansion anchors. Size and nominal embedment depth as indicated on Drawings.
   1. Material: Unless otherwise indicated on the Drawings or as note below, provide carbon steel anchors with zinc plating in accordance with ASTM B633, SC1, Type III. As indicated on the Drawings, and at locations exposed to weather, provide AISI Type 304 or Type 316 stainless steel anchors with manufacturers matching nut and washer.
   2. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
      a. Kwik Bolt TZ, by Hilti, Inc.
      b. Strong-Bolt 2, by Simpson Strong-Tie Co.
      c. Power-Stud+ SD2, by Dewalt.
      d. Trubolt+ Wedge Anchor, by ITW Red Head.

D. Screw Anchors: Hardened steel, screw-type anchors or rod hangers approved for use in cracked and uncracked concrete. Diameter and nominal embedment depth as indicated on Drawings.
   1. Limitations: Anchors shall be used in dry interior environments only.
   2. Material: Case hardened low carbon steel, with zinc plating in accordance with ASTM B633, SC1, Type III. Type 304 or type 316 at locations exposed to weather.
   3. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
      a. Kwik HUS-EZ screw anchor and HUS-EZ1 rod hanger, by Hilti.
      b. Titen HD Screw Anchor and Titen HD Rod Hanger, by Simpson Strong-Tie Co., Inc.
      c. ScrewBolt+, Hangermate+ Rod Hanger, and Snake+ screw anchor by Dewalt.

2.2 ADHESIVE ANCHORS

A. Adhesive Anchors: Threaded steel rod or inserts complete with nuts and washers, epoxy adhesive injection system, and manufacturer's installation instructions.

B. General: Anchors shall be tested and approved for use to resist seismic forces (IBC Seismic Design Categories A to F) in cracked and uncracked concrete in accordance with ICC-ES AC 308.
C. Epoxy Adhesive: Two-component, 100% solids, structural epoxy conforming to ASTM C881, Type IV; Grade 3; prepackaged in cartridges for manually or pneumatically operated caulk gun and automatically mixed at nozzle.
   1. Where anchor manufacturer and product are indicated on Drawings, provide designated product.
   2. Contractor shall be allowed to substitute products of other manufacturer's, subject to demonstrating equivalent tension and shear strength to specified anchor, under project installation conditions.
   3. Where anchor design is prepared by Trade Subcontractor's Engineer, use product designated by Trade Subcontractor's Engineer, subject to meeting requirements of this Section.
   4. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
      a. HIT RE500 V3 Epoxy Adhesive Anchoring System, by Hilti, Inc.
      b. Set-3G Epoxy Adhesive, by Simpson Strong-Tie Co.
      c. Pure 110+, by Dewalt.
      d. Epcon G5 adhesive, by ITW Red Head.

D. Acrylic Adhesive: Hybrid Adhesive: Two-component, hybrid adhesive prepackaged in cartridges for manually or pneumatically operated caulk gun and automatically mixed at nozzle. Approved for use in cracked and uncracked concrete in accordance with ICC ES AC308 or ACI 355.4, as demonstrated by an active ICC or IAPMO Evaluation Service Report.
   1. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
      a. HIT -HY 200 Adhesive, Hilti Inc.
      b. AT-XP Adhesive, Simpson Strong-Tie Co.
      c. AC100+ Gold, Dewalt.

E. Threaded Rod:
   1. Material: Unless otherwise indicated on the Drawings, furnish carbon steel threaded rods conforming to ASTM A36 or ASTM A193 Type B7. As indicated on the Drawings, provide Type 304 or Type 316 stainless steel anchors with manufacturers matching nut and washer.
   2. Finish: Furnish carbon steel rods with zinc plating in accordance with ASTM B633, SC1, Type III at dry interior locations. Furnish carbon steel rods with hot-dipped galvanized coating complying with ASTM A153 at exterior and damp interior locations.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Install anchors in conformance with manufacturer's written instructions.

B. Examination:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Notify Owner's Representative for clarification where reinforcing steel or other embedded items require relocation of anchors or cutting of reinforcement.
   2. Notify Owner's Representative for clarification where anchors appear to be located too close to edge of concrete, in particular where edge is not shown on Drawing detail.
   3. Notify Owner's Representative for clarification where concrete thickness is inadequate to achieve specified anchor embedment. Minimum concrete thickness shall be as indicated in ICC or IAPMO report for full anchor capacity. Where none included in report, or where minimum cover less that above, cover shall not be less than minimum thickness for reduced capacity. Allow for specified embedment, plus one anchor diameter allowance.

Post-Installed Concrete Anchors
05 05 25 -3
for overdrilling, plus 3/4 inch minimum cover from end of hole to concrete surface in all cases when determining minimum thickness for reduced capacity.

C. Drilling:
1. Do not drill holes in concrete mix has achieved full design strength.
2. Drill holes with rotary impact hammer drills using carbide-tipped bits with diameter as recommended by anchor manufacturer. Reduce impact as hole approaches concrete surface as necessary to prevent cracking and spalling. Use core bits only with approval of Owner's Representative and only for mechanical anchors.
3. Holes shall be drilled perpendicular to the concrete surface, unless otherwise shown on Drawings. Anchors shall be drilled to within 5 percent of specified alignment.
4. Exercise care in drilling to avoid damaging existing reinforcing, conduits and other embedded items.

D. Wedge Anchors:
1. Drill holes designated nominal embedment depth plus one anchor diameter minimum. End of hole shall be 3/4 inch minimum clear from concrete surface.
2. Remove dust and debris with pressurized air, in accordance with manufacturer's instructions.
3. Set anchors to designated nominal embedment depth, plus an allowance for withdrawal during torque tightening.
4. Tighten using a torque wrench to manufacturer's recommended installation torque. Following attainment of 10% of recommended torque, achieve 100% of designated torque within 5 or fewer turns of the nut. If torque is not achieved, the anchor shall be removed and replaced unless otherwise directed by the Owner's Representative.

E. Screw Anchors:
1. Take particular care to achieve proper hole diameter. Use only sharp bits with diameter recommended by manufacturer. Use drilling equipment and methods to prevent enlargement of holes by wobble.
2. Remove dust and debris with pressurized air, in accordance with manufacturer's instructions.
3. Install the anchor in accordance with manufacturer's instructions with an impact wrench. Take care not to overtighten anchor; note that manufacturer's maximum installation torque is not the torque intended to be achieved during proper installation.

F. Adhesive Anchors:
1. Drill holes to diameter recommended by manufacturer with rotary impact hammer drills using carbide-tipped bits; core bits shall not be permitted.
2. Thoroughly clean holes by brushing and blowing with compressed air in accordance with manufacturer's instructions. Clean immediately prior to anchor installation under observation of Special Inspector.
3. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole.
4. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

3.2 REPAIR OF DEFECTIVE WORK

A. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.
3.3 FIELD QUALITY CONTROL

A. Testing Laboratory will:
1. Review manufacturer's recommended installation and inspection procedures, as contained in Evaluation Service Report.
2. Special Inspect installation for conformance with Contract Documents, manufacturer's recommendations, and requirements of the applicable ES report. Verify that anchors are being installed by trained installers.
   a. Periodically inspect installation of mechanical anchors.
   b. Continuously inspect installation of adhesive anchors during hole cleaning and anchor installation.
3. Proof test a random sample of dowels in accordance with the following requirements, except where Drawings designate that no proof testing is required.
   a. Wedge Anchors: Torque test 25% of anchors to recommended installation torque using a calibrated wrench. Anchor should not rotate more than 1/2 turn.
   b. Screw anchors: Torque test 25% of anchors to 10% of manufacturer's recommended installation torque using a calibrated wrench. Anchor should not rotate more than 1/4 turn.
   c. Adhesive Anchors: Tension test a minimum of two anchors of each type for each installer for each day's placement. Use hydraulic ram testing for bond, confined configuration. There shall be no discernible movement of anchor from hole after 15 seconds of loading. Test to loads shown on Drawings or as indicated by Owner's Representative.

END OF SECTION
PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes:
   1. Structural steel.

1.3 REFERENCES

A. Standards listed below apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

B. ASTM: Standards of the American Society for Testing and Materials (ASTM) apply where designated in this Section. Use applicable year of adoption or revision as published in AISC 360-10.

C. CBC: 2016 California Building Code


E. American Institute of Steel Construction’s
      a. The General Conditions, Special Conditions and Division 1 shall govern in the case of conflicts with provisions of the AISC 303.

F. American Welding Society’s

G. Research Council on Structural Connections’


1.4 DEFINITIONS

A. Structural Steel: As classified by Section 2 of AISC 303.
B. Seismic Load Resisting System (SLRS): Members and connections designed to resist seismic forces, as designated on the drawings.

1.5 SUBMITTALS

A. Submittal procedures and administrative provisions are established by Division 01 Section "Submittal Procedures".
   1. Requirements of "Submittal Procedures" supersede provisions of Section 4.4 of AISC 303 Code, indicating time for review of shop drawings.

B. Shop Drawings: Show complete information necessary for the fabrication and erection of structural-steel components in accordance with ANSI/AISC 360.
   1. Identify surface preparation and finish.

C. Mill Test Reports: Submit test reports certifying compliance with specified standards to Testing Laboratory for record purposes.
   1. Steel.
   2. Bolts, nuts and washers.
   3. Welding filler materials, fluxes and shielding gases.

D. Product Data: For each type of product indicated, including but not limited to weld filler materials, shop primers, bar couplers and deformed bar anchors.

E. Welder Performance Qualification Records (WPQR's). Submit to Testing Laboratory for record purpose.

F. Welding Procedure Specification (WPS) for each different welded joint proposed for use, whether prequalified or qualified by testing.
   1. Prepare in accordance with AWS D1.1 requirements.
   2. Include procedure qualification record (PQR) for procedures qualified by testing.
   3. For Demand Critical welds, conform to additional requirements of AWS D1.8.
   4. Allow sufficient time for review by Testing Laboratory in addition to review by Owner's Representative.

G. High strength bolt installation procedure.

H. Samples: As requested by the Testing Laboratory.

1.6 QUALITY ASSURANCE

A. Comply with applicable provisions of AISC 303, ANSI/AISC 341, ANSI/AISC 360, except where more stringent requirements are shown or specified.

B. Fabricator Qualifications:
   1. A fabricator having a minimum of five years' experience in structural steel framed building projects of similar size and designed for similar seismic demands. Similar size shall be project having no less than 90% square footage of this project. Similar seismic demands shall be projects designed for a short period pseudo acceleration, $S_{DS}$, of 0.9 g or greater.

C. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS D1.1.
   1. Welders performing Demand Critical welds made through a beam web access hole or gusset plate access hole shall have Supplemental Welder Qualification for Restricted Welding in accordance with AWS D1.8.
1.7 COORDINATION

A. Provide metal templates and setting drawings for installation of anchorage items embedded in other work.

B. Furnish embedded anchorage items to avoid delays to other Work.

C. Survey embedded items for proper location prior to delivery of steel.

PART 2 – PRODUCTS

2.1 STEEL MATERIALS

A. General: All steel shall be identified as required by CBC Section 2203.1. Steel that is not properly identified shall be tested to show conformance with requirements of applicable ASTM Standard at Contractor's expense.


C. Channels and Angles: ASTM A36; except ASTM A572, Grade 50 may be substituted at Fabricator's option to suit material availability.
   1. Furnish ASTM A572, Grade 50 material where designated on drawings.

D. Plates and Bars: Furnish Grade 50 material, unless otherwise designated.
   1. Grade 50: ASTM A572, Grade 50; ASTM A588, Grade 50; or ASTM A529, Grade 50 or Grade 55.
      a. Grade 50 material shall be acceptable for all uses, except bolted shear tabs at beam-to-column connections.
   2. Grade 36: ASTM A36.
      a. Provide Grade 36 material for bolted shear tabs at beam-to-column connections and where designated on drawings.
   3. Supply Charpy V-Notch impact testing, in accordance with ASTM A6, Supplementary Requirement S5, for plates 2 inches thick or thicker used in the Seismic Load Resisting System. Steel shall minimum average value of 20 ft-lbs at +70 deg F when tested in accordance with ASTM A673, Frequency P. Requirement applies to the following:
      a. Plates for built-up members used in the SLRS.
      b. Baseplates for SLRS columns.
      c. SLRS connection plates, including continuity plates and gusset plates.

E. Pipes: ASTM A53, Type E, Grade B.

F. Structural Tubing:
   1. Square and rectangular HSS: ASTM A500, Grade B.
   2. Round HSS: ASTM A500, Grade B.

2.2 BOLTS, ANCHORS AND CONNECTORS

A. High Strength Bolts: One of the following, unless otherwise designated on Drawings.
   1. ASTM F3125, Grade 325, Type 1, heavy hex structural bolts with ASTM A563, Grade C or DH heavy hex nuts and ASTM F436 hardened washers.
   2. ASTM F3125, Grade F1852, Type 1, round head tension control bolts with ASTM A563, Grade C or Grade DH heavy hex nuts and ASTM F436 hardened washers.

B. A 490 Bolts: Provide where designated on Drawings.
1. ASTM F3125, Grade A490, Type 1, heavy hex structural bolts with ASTM A563, Grade DH heavy hex nuts; ASTM F436 hardened washers, and ASTM F959, Type 490 direct-tension indicator washers.

2. ASTM F3125, Grade F2280, Type 1, round head tension control bolts with ASTM A563, Grade DH heavy hex nuts and ASTM F436 hardened washers.


D. Anchor Rod Assembly:
   1. Anchor rod: ASTM F1554, Grade 36; end threaded.
   2. Head: Form head with ASTM A563, Grade A, heavy hex nut. Lock against loosening with suitable jam nut.
   4. Washer: Provide steel plate washer of sufficient size to completely cover hole in baseplate; minimum thickness shall be 1/3 of bolt diameter.


   1. Substitution of ASTM A706 bars of equal size will be permitted, subject to approval of welding procedure by Owner's Representative.


   1. Accessories, including clevises and turnbuckles, shall conform to ASTM A108, Grade 1035, cold-finished carbon steel; and capable of developing specified tensile strength of rod.

2.3 WELDING CONSUMABLES

A. General: Filler materials and fluxes shall conform to requirements of AWS D1.1; of suitable type for base metals being welded and the intended application.

   1. Electrodes for SMAW shall be low hydrogen.

B. Filler and weld metal used for welds of Seismic Lateral Resisting System (SLRS) members and connections shall conform to additional requirements of AWS D1.8, Section 6.3.

C. Filler and weld metal used for complete-joint-penetration Demand Critical welds shall conform to additional requirements of AWS D1.8, Sections 6.3.5, 6.3.6, 6.3.7 and 6.3.8.

2.4 OTHER ITEMS

A. Primer Paints:

   1. Primer paints listed below shall only be used where VOC limits of locale where primer is applied to steel are not exceeded. Contractor shall apply listed primer paints in such locales.

   2. Type A Primer: Fast-drying, rust-inhibitive, chromate- and lead-free modified alkyd primer. Acceptable Products: Series V10 by Tnemec, 42 Series by Maclac, or approved equal
3. Type B Primer: SSPC-Paint 20, Type II. Organic, zinc-rich primer; containing less than 0.002% lead. Acceptable Products: Series 90-97 Tneme-Zinc by Tnemec, Carbozinc 621 by Carboline, or approved equal.

B. Galvanizing Repair Paint: ASTM A780.

2.5 FABRICATION

A. Fabricate structural steel in accordance with AISC 303 and ANSI/AISC 360.
   1. Conform to additional requirements of ANSI/AISC 341 for members and connections of the Seismic Load Resisting System.

B. Thermal Cutting:
   1. Make cuts by machine or using mechanical guide.
   2. Processes shall be limited to Plasma Arc or Oxyfuel Gas processes, except as approved by Owner's Representative.
   3. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

D. High Strength Bolted Connections: Install bolts according to RCSC’s “Specification for Structural Joints Using ASTM A325 or A 490 Bolts” for type of bolt and joint specified.
   1. Bolt installation: Pretensioned, except where otherwise designated on Drawings.
   2. Faying surfaces: Class A surfaces, in accordance with requirements for slip-critical connections.
   3. Hole type: Standard, except where designated on Drawings.
      a. Do not punch holes in material greater than 1/2 inch in thickness, unless approved in writing by Owner's Representative.

E. Welding:
   1. Weld in accordance with ANSI/AISC 360 and AWS D1.1 using manual shielded arc method (SMAW), flux cored arc method (FCAW), or gas shielded arc method (GMAW).
   2. Weld in accordance with welding procedure specifications (WPS's) for joint, which are to be available to welders and inspectors during the production process.
   3. Groove welds shall be complete joint penetration welds, unless designated otherwise on drawings. Groove preparation is at Contractor's option, subject to qualification in accordance with AWS D1.1.
      a. Use double bevel groove welds for sections thicker than 1-1/2 inches, wherever practical.
   4. Partial penetration welds shall have an effective throat thickness as designated on drawings. Groove preparation is at Contractor's option, subject to qualification in accordance with AWS D1.1.
   5. End dams shall not be used, except at the outboard end of weld tabs that are removed. Provide beveled transitions at changes in groove profile.
   6. For members and connections of the Seismic Load Resisting System (SLRS), conform to supplemental requirements of AWS D1.8 and the following:
      a. Use filler materials specified for SLRS welds.
      b. Weld access holes for complete penetration beam flange to column connections shall be shaped in accordance with AWS D1.8, Paragraph 6.9.1.2, “Alternate Geometry”; and conform to quality requirements of Paragraph 6.9.2.
   7. Demand Critical welds: Conform to requirements for welding of members and connections of the SLRS, the supplemental requirements of AWS D1.8 applicable to Demand Critical welds, and the following:
      a. Use filler materials specified for Demand Critical welds.
      b. Remove backing bars where designated on drawings.
      c. Provide a reinforcing fillet at locations where backing bars are removed.
8. Weld reinforcing steel bar couplers to structural steel in accordance with AWS D1.1 using qualified procedures and in accordance with manufacturer's recommendations.

2.6 FINISHES

A. General:
   1. Cleaning: All steel shall be free of oil and grease. Clean as required in accordance with SSPC SP1 "Solvent Cleaning".
   2. Preparation: All steel shall be free of loose mill scale and foreign matter. Clean as required by SSPC SP 2 "Hand Tool Cleaning".

B. Unpainted: Structural steel at the building interior that is concealed by finishes or fireproofed in the completed construction may remain unpainted.
   1. Steel may be prime painted at Contractor's option, except for the following:
      a. Members to receive spray fireproofing.
      b. Surfaces in contact with concrete, except initial two inches.
      c. Faying surfaces of high strength bolted connections.
      d. Surfaces within 1 inch of field weld locations.

C. Interior Prime Painted: Prime paint interior surfaces that will remain visible in the completed construction.
   1. Surface preparation: SSPC SP3 "Power Tool Cleaning", except prepare AESS surfaces in accordance with SSPC 6 "Commercial Blast Cleaning".
   2. Primer: Type A, at 2.5 mils dry film thickness. Where steel is scheduled to be finish painted, verify that primer is compatible with finish painting systems.
   3. Do not paint faying surfaces of high strength bolted connections and within 1 inch of field weld locations.

D. Exterior Prime Painted: Prime paint surfaces that are outside the weatherproof envelope, including concealed surfaces.
   1. Surface preparation: SSPC SP6 "Commercial Blast Cleaning". Ease corners of plates and shapes to 1/16-inch minimum chamfer.
   2. Primer: Type B, at 3 mils dry film thickness. Verify that primer is compatible with finish painting systems.
   3. Do not paint within 1 inch of field weld locations; paint faying surfaces of bolted connections.
   4. Schedule application of intermediate coats prior to erection, where steel cannot be properly field coated after erection.

E. Hot-Dip Galvanizing: Hot dip galvanize items designated on drawings.
   1. Galvanize items in accordance with ASTM A123.
   2. Provide hot dip galvanized fasteners for connection of galvanized items, except do not galvanize A490 bolts. Galvanize in accordance with ASTM A153, Grade 50.
   3. Obtain approval for locations of vent holes in closed sections.

2.7 SOURCE QUALITY CONTROL

A. Inspection and testing will be performed in accordance with procedures and administrative requirements of Division 01 Section, "Quality Requirements".

B. Special Inspection and testing shall be made in accordance with CBC Section 1705.2, AISC 360, and AISC 341.
Testing Laboratory will:

1. Collect and review material test reports and certificates in accordance with AISC 360 chapter N3.2 including but not necessarily limited to:
   a. Material test reports for structural steel elements, steel castings and forgings, anchor rods and threaded rods verifying compliance with specified requirements.
   b. Certificates for fasteners, welding consumables, and headed studs, verifying compliance with specified requirements.
   c. Review welding procedure specifications for compliance with applicable requirements of AWS D1.1 and AWS D1.8.
      1) Verify that machine settings and travel speed correspond to electrode manufacturer's recommendations.
   d. Review procedure qualification records for weld procedure specifications that are not prequalified in accordance with AWS D1.1.
   e. Collect and review qualifications of welders.
   f. Review material identification and control procedures for conformance with requirements of the CBC Section 2203.1, AISC 360.N2, and AISC 303.6.1

2. Inspect high-strength bolting in accordance with requirements of AISC 360 Chapter N5.6 “Inspection of High Strength Bolting”.
   a. Perform additional QA inspection tasks and documents listed in ANSI/AISC 341, Section J7, “Inspection of Bolting” for Seismic Force Resisting System member connections.

3. Inspect shop and field welding in accordance with requirements of AISC 360-10 Chapter N.54 “Inspection of Welding”.

4. Ultrasonic test 100 percent of complete joint penetration welds in materials 5/16-inch or greater. Perform testing in accordance with procedures and acceptance criteria of AWS D1.8, Section 7.10, “Ultrasonic Testing”.
   a. Subject to approval of authority having jurisdiction, the amount of testing will be permitted to be reduced in accordance with provisions of ANSI/AISC 341, Section J, paragraph J6.2g, “Reduction of Percentage of Ultrasonic Testing”.

5. For members and connections of the Seismic Force Resisting System, perform additional nondestructive testing (NDT) of welds and base metal adjacent to welds in accordance with provisions of ANSI/AISC 341, Section J, paragraph J6.2. Perform tests in accordance with applicable requirements of AWS D1.8, Section 7, “Inspection”.
   a. MT inspection of k-area base metal in web, where welding of continuity plates, doubler plates or stiffener plates occurs in k area.
   b. MT inspection of beam-to-column CJP’s.
   c. UT testing of base metal, including baseplates, thicker than 1-1/2 inches for laminations where connected material is greater than 7/8 inches.
   d. MT testing of beam copes and access holes at welded connections where flanges are thicker than 1-1/2 inches.

PART 3 – EXECUTION

3.1 PREPARATION

A. Examine construction to support steel erection and verify the following:
   1. Location and elevation of bearings and anchor bolts are correct.
   2. Other conditions adversely affecting erection of steel are absent.

B. Do not begin erection before unsatisfactory conditions have been corrected.
3.2 ERECTION

A. Erect structural steel in accordance with AISC 303 and ANSI/AISC 360.
   1. Conform to additional requirements of ANSI/AISC 341 for members and connections of the Seismic Load Resisting System.

B. Where erection requires performing work of fabrication on site, conform to applicable requirements of “Fabrication”.
   1. Thermally cut edges shall be made with mechanical guides and meet requirements of AWS D1.1, Section 5.15 for acceptable roughness, notches and gouges.

C. Field corrections will not be permitted without the prior approval of the Owner’s Representative.

D. Field Touch-up Painting:
   1. Touch-up paint field welded connections and abrasions using same paint used for shop priming.
   2. Prior to painting welds, thoroughly chip and wire brush. Wash with dilute solution of phosphoric acid (approximately 5%) and rinse with water. Allow surface to dry prior to painting.
   3. Touch up galvanized surfaces in accordance with ASTM A780.

3.3 CLEANING

A. After erection, thoroughly clean surfaces of foreign or deleterious matter such as dirt, mud, oil, or grease that would impair bonding of fire-retardant coating, paint or concrete.

3.4 FIELD QUALITY CONTROL

A. Inspection and testing will be performed in accordance with procedures and administrative requirements of Division 01 Section, "Quality Requirements".

B. Testing Laboratory will:
   1. Inspect and test field high strength bolting and welding in accordance with “Source Quality Control”.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Metal studs and furring for support of gypsum board and other finishes.
   2. Backing for interior items to be attached to gypsum board and metal studs.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Section
   1. Section 07 92 00 - Joint Sealants: Provision of acoustical sealant.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials
   2. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   3. C645 - Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.

B. CBC - California Building Code, 2016 Edition

C. GA - Gypsum Association
   1. 203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.

D. UL - Undewriters Laboratories Inc.

E. United States Gypsum Company

1.3 SYSTEM DESCRIPTION

A. Design Requirements
   1. Plumb, true, straight and rigid framing for support of attached materials.
   2. Design system to accommodate construction tolerances, deflection of building structural members, support of attached materials and clearances of intended openings in accordance with CBC.
   3. Use galvanized metal studs and channels at all shower and wet locations.
1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings indicating component details, framed openings, anchorage to structure and accessories or items required of other related work. Include shop drawings for backing plates for cabinets, grab bars and other wall mounted items.

1.5 QUALITY ASSURANCE


1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection
   1. Deliver materials to job site and store in ventilated dry locations. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather.
   2. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers
   1. Steel Framing and Furring: Gold Bond Building Products Div., National Gypsum Co.; Clark Steel Framing; Dietrich Industries, Inc., or equal.
   2. Grid Suspension Assemblies: Chicago Metallic Corp.; USG Interiors, Inc.; National Rolling Mills Co., or equal.

2.2 STEEL FRAMING FOR PARTITIONS

A. Studs: C-shaped, ASTM C645, G-90; non-load bearing rolled steel, channel shaped, punched for utility access.
   1. Width: As appropriate for spanning distance in accordance with ASTM C645.
   2. Thickness: Contractor shall verify size of metal studs and gauge based on allowable finish deflection criteria L/240 maximum.
   3. Tracks: Match stud grade.
   4. Spacing: 16 inches on center throughout.

B. Deflection Tracks: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A568 or ASTM A653. Thickness as indicated for studs and width to accommodate depth of studs and of the following configuration:
   1. Top Runner with Slotted Flanges: 2-1/2 inch deep flanges with slots 1 inch on center.

C. Furring and Bracing Members: Same material and finish as studs, thickness to suit purpose.

D. Steel Rigid Furring Channels: ASTM C645, hat shaped, depth of 7/8-inch, and minimum thickness of base (uncoated) metal as follows:
   1. Thickness: 0.0179-inch, unless otherwise indicated.
E. Z-Furring Members: Manufacturer’s standard Z-shaped furring members with slotted or nonslotted web, fabricated from steel sheet complying with ASTM A568 or ASTM A653; with a minimum base metal (uncoated) thickness of 0.0179-inch, face flange of 1-1/4 inch, wall-attachment flange of 7/8-inch, and of depth required to fit insulation thickness indicated.


I. Metal Backing Plates
   1. Type 2 (Heavy Loads): As indicated on the Drawings.
   2. Type 3 (300 Pounds and Up): As indicated on the Drawings.

J. Anchorage Devices: Provide drilled in anchors or powder driven fasteners, 0.118-inch diameter with 1-inch embed.

K. Bracing: Provide cross diagonal straps, attached as indicated on the Drawings and per stud manufacturer’s specifications for frame stability.

2.3 MISCELLANEOUS MATERIALS

A. Acoustical Sealant: As specified in Section 07 92 00.

B. Galvanized Finish Touch-Up Coating: Liquid zinc compound that bonds electrochemically to iron, steel and aluminum, as manufactured by ZRC Chemical Products, “ZRC Cold Galvanizing Compound”; ZRC Worldwide; Rust-Oleum, or equal.

2.4 FINISHES

A. Galvanized Surfaces: Where galvanizing is removed by welding or other assembly procedures, clean area of any foreign matter by wire brushing and metal conditioner recommended by galvanized finish touch-up manufacturer. Apply galvanized touch-up coating by brush or spray with minimum coverage of 1.4 mils, dry film.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive metal support framing systems and verify the following:
   1. Installation of building components located in walls is complete.
   2. Backing plates are properly located for support of wall hung items.

B. Beginning of installation means installer accepts existing conditions.

3.2 INSTALLING STEEL FRAMING FOR PARTITIONS

A. Stud Partitions - Typical
   1. Align and secure top and bottom tracks. Place 2 beads of acoustic sealant between tracks and substrate.
2. Fit tracks under and above openings; secure intermediate studs at spacing of wall studs.
3. Install studs vertically at spacing as indicated. Place 2 beads of acoustic sealant between studs and adjacent vertical surfaces.
4. Connect studs to tracks using fastener method.
5. Construct corners using minimum 3 studs.
6. Double studs vertically at wall openings, door and window jambs and not more than 2 inches each side of openings, unless otherwise specified. Provide track and stud horizontally at wall, window head and sill openings.
7. Brace stud framing system and make rigid.
8. Coordinate erection of studs with requirements of door and window frame supports and attachments.
10. Coordinate installation of jamb anchors and metal backing plates with electrical and mechanical work to be placed in or behind stud framing.

B. Double Wall Partitions: Do not brace or connect rigid members across separation between stud rows. Use specified resilient sway bracing only. At fire-rated conditions of 2 hours and less, conform with UL design U493.

C. Backing in Stud Partitions or Furring
1. Verify that any pre-drilling of backing and attachment of spacers to prevent crushing of attached material is done prior to application of attached material.
2. If it is determined by the Architect that backing was not provided for any items as required, the Contractor shall remove the finish materials; install backing and shall patch and refinish surface to match adjacent area and surface at no additional cost to the Owner.

D. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8-inch from plane of faces of adjacent framing.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Metal handrails, guardrails, and railings as indicated on the Drawings.
2. Non-structural miscellaneous metal channels, angle imbeds, bent metal plates at ceiling reconstruction, and other shapes as required.
3. Rough hardware.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Section
1. Section 09 90 00 - Painting and Coating: For finish painting of items not specified to have factory finish.

1.2 REFERENCES

A. AISC - American Institute of Steel Construction Inc.

B. ANSI - American National Standards Institute

C. ASTM - American Society for Testing and Materials
9. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
10. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

D. AWS - American Welding Society
   1. D1.1 - Structural Welding Code - Steel.
   2. D1.3 - Structural Welding Code - Sheet Steel.

E. CBC - California Building Code, 2016 Edition

F. NAAMM - National Association of Architectural Metal Manufacturers
   1. MFM - Metal Finishes Manual for Architectural and Metal Products.

G. OSHA - Occupational Safety and Health Administration

H. SSPC - The Society for Protective Coatings
   1. PA 1 - Shop, Field, and Maintenance Painting of Steel.
   2. SP 2 - Hand Tool Cleaning.
   3. SP 3 - Power Tool Cleaning.
   4. SP 6 - Commercial Blast Cleaning.

1.3 SYSTEM DESCRIPTION

A. Design Requirements
   1. Structural Performance of Guardrails, Handrails, and Railings: Provide guardrails, handrails, and railing systems that shall withstand structural loads without exceeding the allowable working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each of the respective components of each metal fabrication in accordance with CBC.
   2. Design work to support normally imposed loads and in conformity with AISC requirements.
   3. Provide for expansion and contraction.
   4. Shop drawings and calculations for metal fabrications engineered under work of this Section shall be prepared under direct supervision of State of California licensed Structural Engineer and shall be so wet stamped and wet signed.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer’s product data for warning strips, paint products, and grout.

B. Shop Drawings: Submit shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.

C. Quality Control Submittals: Welder certificates signed by Contractor certifying that welders comply with requirements specified under the “Quality Assurance” Article.
1.5 QUALITY ASSURANCE

A. Welding Standards: Comply with applicable provisions of AWS D1.1 and AWS D1.3.
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding
      processes involved and, if pertinent, has undergone recertification.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work,
   provide materials selected for their surface flatness, smoothness, and freedom from surface
   blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade
   names, or roughness.

B. Steel and Iron
   1. Steel Plates, Shapes, and Bars: ASTM A36.
   2. Rolled Steel Floor Plate: ASTM A786, rolled from plate complying with ASTM A36 or
      ASTM A283, Grade C or D.
   3. Cold-Formed Steel Tubing: ASTMA500.
   4. Hot-Formed Steel Tubing: ASTMA501.
   5. Steel Pipe: ASTM A53, Type S, Grade B, Schedule 40, unless otherwise indicated, or
      another weight required by structural loads.
      a. Black finish, unless otherwise indicated.
      b. Prime with red oxide primer at locations detailed to receive paint.
   7. Malleable-Iron Castings: ASTM A47, grade as recommended by fabricator for type of use
      indicated.
   8. Concrete Inserts: Anchors of type indicated below, fabricated from corrosion resistant
      materials capable of sustaining, without failure, the load imposed within a safety factor of
      4, as determined by testing per ASTM E488, conducted by a qualified independent testing
      agency.
      a. Threaded or wedge type; galvanized ferrous castings, either ASTM A47 malleable
         iron or ASTM A27 cast steel. Provide bolts, washers, and shims as required, hot-
         dip galvanized in accordance with ASTM A153.
      b. Provide weld plate imbedded in concrete as detailed in the Drawings. Coordinate
         location with other imbedded materials.

C. Fasteners: Provide plated fasteners complying with ASTM B633, Class Fe/Zn 25 for
   electroplated zinc coating, for use where built into exterior walls, concrete slabs, or ceilings.
   Select fasteners for the type, grade, and class required.
   1. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A, with hex nuts, ASTM
      A563, and, where indicated, flat washers.
   5. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with
      capability to sustain, without failure, a load equal to 6 times the load imposed when
      installed in unit masonry and equal to 4 times the load imposed when installed in concrete
      as determined by testing per ASTM E488 conducted by a qualified independent testing
      agency.
      a. Material: Carbon steel components zinc-plated to comply with ASTM B633, Class
         Fe/Zn 5.
      b. Material: Group 1 alloy 304 or 316 stainless steel bolts and nuts complying with
         ASTM F593 and ASTM F594.

D. Welding Materials: AWS D1.1, type required for materials being welded.

2.2 STANDARD CATALOG PRODUCTS

A. Non-Shrink Grout
   1. Premixed; containing no metallic particles, requiring only addition of water.
   2. Shall have minimum working time of 15 minutes and initial set time of 30 to 45 minutes in accordance with ASTM C191.

B. Expansion Cement
   1. Non-metallic, non-corrosive, pourable hydraulic type cement that is quick-setting, high strength, and non-shrinking, with the following properties
      a. Compressive Strength: 58,400 psi at 7 days in accordance with ASTM C109.
      b. Volume Change: Plus 0.31 at 7 days in accordance with ASTM C157.

C. Coatings
   2. Shop Primer for Ferrous Metal: VOC compliant, fast-curing, lead and chromate free, universal modified alkyd primer with good resistance to corrosion, compatible with finish paint systems.
   3. Galvanizing Repair Paint: High zinc dust content paint, with dryfilm containing not less than 94 percent zinc dust by weight, as manufactured by Parker Amchem, “Galvaprep SG”; Sherwin Williams, “Zinc Clad I”, or equal.

D. Handrail Brackets: As indicated and as selected by the Architect.

2.3 FABRICATION, GENERAL

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on Construction Drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

C. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
   1. Temperature Change (Range): 100 degrees Fahrenheit.

D. Shear and punch metals cleanly and accurately. Remove burrs.
E. Ease exposed edges to a radius of approximately 1/32-inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

F. Remove sharp or rough areas on exposed traffic surfaces.

G. Weld corners and seams continuously to comply 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. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

K. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

L. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.4 GUARDRAILS, HANDRAILS, AND RAILINGS

A. Steel
1. General: Fabricate steel guardrails, handrails, and railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube or pipe, post spacings, and anchorage, but not less than that required to support structural loads.
   a. Tube Diameter: As indicated.
2. Interconnect handrail and railing members by butt-welding or welding with internal connectors, at fabricator’s option, unless otherwise indicated.
   a. At tee and cross intersections, cope ends of intersecting members to fit contour of pipe to which end is joined, and weld all around.
3. Form changes in direction of handrails and railings as detailed.
4. Form simple and compound curves by bending tube or pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of tube or pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
5. Provide wall returns at ends of wall-mounted handrails as indicated.
6. Close exposed ends of tube or pipe by welding 3/16-inch thick steel plate in place or with prefabricated fittings.
7. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, post base flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of handrails and railing systems to other work. Furnish inserts and other anchorage devices for connecting handrails and railing systems to concrete.

8. Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.

9. For galvanized handrails and railing systems, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.

B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Except as otherwise indicated, space anchors 24 inches on center and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4-inch thick by 8 inches long.

C. Galvanize miscellaneous interior framing and supports.

2.6 STEEL AND IRON FINISHES

A. General: Comply with NAAMM’s MFM for recommendations relative to applying and designing finishes. Finish metal fabrications after assembly.

B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Typical: SSPC SP 2, SSPC SP 3, as required.

C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC PA 1 for shop painting.

D. Powder Coating: Apply at handrails, guardrails, and railings as indicated on the Drawings.

E. Finish Painting: As specified in Section 09 90 00.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required. Fasteners not installed but required after pour shall be
submitted to the Architect for approval. Fastener shall not be installed until the Architect
approval is received.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing
miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and
elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from
established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete
masonry or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are
not to be left as exposed joints but cannot be shop-welded because of shipping size limitations.
Do not weld, cut, or abrade the surfaces of units that have been galvanized after fabrication and
are intended for bolted or screwed field connections.

E. Field Welding
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. At exposed connections, finish exposed welds and surfaces smooth and blended so that
no roughness shows after finishing and contour of welded surface matches those
adjacent.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with
gROUT, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING GUARDRAILS, HANDRAILS, AND RAILINGS

A. Adjust guardrails, handrails, and railing systems prior to anchoring to ensure matching
alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by
design loadings. Plumb posts in each direction. Secure posts and railing ends to building
construction as follows
1. Anchor posts to post tension concrete by welding directly to imbedded steel supporting
members.
2. Anchor handrail and post ends to cast-in-place concrete and masonry with steel flanges
welded to rail ends and anchored into wall construction with drilled-in epoxy and bolt
anchors.

B. Secure handrails to wall with wall brackets and end fittings. Provide bracket with 1-1/2 inch
clearance from inside face of handrail and finished wall surface. Locate brackets as indicated
or, if not indicated, at spacing required to support structural loads. Secure wall brackets and wall
return fittings to building construction as follows:
1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2. For wood stud partitions or walls, use hanger or lag bolts set into wood backing between
studs. Coordinate with carpentry work to locate backing members.
3. For steel framed gypsum board assemblies, fasten brackets directly to steel framing or
concealed anchors using self-tapping screws of size and type required to support
structural loads.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and
abraded areas of shop paint, and prime and paint exposed areas with same material as used
for shop painting to comply with SSPC PA 1 requirements for touching up shop- painted surfaces.

1. Apply by brush or spray to provide a 2.0-mil minimum dry film thickness.

B. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A780.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes:
   1. Softwood structural framing.
   2. Glued-laminated members, used for framing.
   3. Engineered lumber, used for framing.
   4. Plywood wall, floor and roof sheathing.
   5. Wood furring, blocking, backing, corners, and nailers as required for finishes and for support of accessories and finish hardware.

B. Related Sections:
   1. Section 07 21 01 – Building Insulation: Provision of acoustical insulation.
   2. Section 09 68 00 – Carpeting: For installation of Owner-furnished carpet.
   3. Section 09 90 00 – Painting and Coating: For finish painting.

1.3 REFERENCES

A. Standards listed below apply where designation is cited in this Section. Where the applicable year of adoption or revision is not listed below, the latest edition applies.

B. ASTM: Standards of the American Society for Testing and Materials (ASTM) apply where designated in this Section. Use applicable year of adoption or revision as published in the 2016 “Annual Book of ASTM Standards”.

C. American Wood Council (AWC)

D. American Institute of Timber Construction (AITC)

E. American Wood Protection Association (AWPA)


G. IAPMO Evaluation Service (IAPMO-ES)
H. ICC Evaluation Service (ICC-ES)

I. U.S. Department of Commerce, National Institute of Standards and Technology (DOC,NIST)

J. West Coast Lumber Inspection Bureau’s
   1. WCLIB - Standard Grading Rules No. 17.

1.4 SUBMITTALS

A. Submittal procedures and administrative provisions are established by Division 01 Section "Submittal Procedures".

B. Product Data: For manufactured products, including framing connectors.

C. Samples: As requested by Owner’s Representative.

1.5 QUALITY ASSURANCE

A. Lumber and plywood shall bear grade-trademarks of appropriate grading agency.
   1. Pressure preservative treated lumber and plywood shall bear an AWPA tag.
   2. Fire-retardant-treated lumber shall bear the stamp of the inspection agency in accordance with ICC-ES AC66, "Acceptance Criteria for Fire-Treated Wood".

B. Framing connectors shall be installed in accordance with applicable ICC-ES or IAPMO-ES Evaluation Report.

C. Mockup: Prepare mockup panel demonstrating acceptable range of nail head position at plywood sheathing. After review and acceptance by Owner’s Representative, maintain panel on site as standard for judging the completed work.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends, and surfaces.

B. Deliver and store packaged products in original containers or bundles with seals unbroken and labels intact until time of use.

C. Keep lumber and plywood dry. Stack off ground and fully protected from weather.

1.7 COORDINATION

A. Coordinate with other work supporting, adjoining or fastening to rough carpentry work.

PART 2 – PRODUCTS

2.1 LUMBER
A. Sizes and surfacing: In accordance with PS – 20; surfaced four sides, unless otherwise noted.

B. Moisture content: Air-dry or kiln-dry lumber. Maximum moisture shall be 13 percent maximum at time of delivery to jobsite.
1. Kiln dry pressure treated lumber after treatment to maximum 13 percent moisture content.
2. Moisture content for glued-laminated members shall be in accordance with AITC 190.1

C. Framing lumber: Provide Douglas Fir structural lumber of the grades listed below for the various purposes, except as otherwise designated on drawings:
1. Studs, blocking, backing and nailers (2 to 4 inches thick, 4 inches wide):
   WCLIB Construction grade Douglas Fir.
2. Studs, blocking, backing and nailers (2 to 4 inches thick, 6 inches and wider):
   WCLIB No. 2 grade Douglas Fir.
4. Built-up headers, joists, and blocking (2 inches thick, 6 inches and wider):
   WCLIB No. 1 & Better grade, Douglas Fir, S-dry.
5. Headers, framing beams, ledgers and blocking: (nominal 4 inches and thicker, 6 inches and wider): ANSI/AITC A190.1 glue-laminated lumber, stress class SC 24F - 1.8 E, framing appearance grade. Nominal 6 inch material may be furnished in 5-1/4 inch or 5-1/2 inch width.
6. Posts (6 inches thick, 6 inches and wider): WCLIB No. 1 grade Douglas Fir, 25 percent maximum moisture content shall be acceptable.
7. Preservative treated lumber: WCLIB No. 1 & Better grade Douglas Fir, pressure preservative treated as specified herein.

D. Preservative treated lumber: Pressure treatment of wood products shall conform to the requirements for the specified Use Category in accordance with AWPA U1. The following items shall be preservative treated:
1. Wood sills in contact with concrete foundations or floor slabs on ground: Use Category UC2.
2. Wood framing and plywood wall sheathing at the first-floor level of structures having crawl spaces when the bottoms of such items are 24 inches or less from the earth underneath. Use category UC2.
3. Wood sills or ledgers in contact with concrete or masonry that is exposed to weather: Use Category UC3B.

E. Fire-retardant-treated lumber and plywood: Use Category UCFA, Interior Type A (HT), in accordance with AWPA U1. Items to be treated include the following:

2.2 SHEATHING

A. General: Sheathing panels shall be plywood manufactured conforming to PS-1, except as otherwise designated.
1. Conform to requirements specified herein for various purposes, except as otherwise designated on Drawings.

B. Roof sheathing: 15/32 APA [STRUCTURAL I] Rated Sheathing [32/16], Exposure 1, 5-ply minimum.

C. Plywood backing panels (for mounting electrical and telephone equipment): C-D Plugged, Exposure 1, 23/32 inch thickness, fire-retardant treated.

2.3 CONNECTORS AND FASTENERS
A. General: Provide connectors and fasteners as required to complete work.
   1. Steel connectors and fasteners exposed to weather shall be hot-dip galvanized in accordance with ASTM A153, unless otherwise noted.
   2. Steel connectors and fasteners for pressure preservative treated and fire-retardant treated wood shall be hot-dip galvanized in accordance with ASTM A153, 1 oz minimum each face or other coating recommended by manufacturer and acceptable to Owner’s Representative.

   1. Nail sizes indicated on Drawings are common nails, unless otherwise indicated.
   2. Nails may be coated to facilitate installation at Contractor’s option.
   3. Provide ring shank nails for fastening of combined subfloor/underlayment floor sheathing.

C. Framing connectors: Galvanized steel; designations shown on Drawings refer to products of Simpson Strong-Tie Company. Products furnished shall have current ICC Evaluation Service approved load values at least equal to those of products designated. Acceptable manufacturers are Simpson Strong-Tie Co., K.C. Metal, United Steel products, or equal.

D. Bolts and anchor bolts: ASTM A307, Grade A, hex head bolts with matching nuts. Furnish with ASTM F844 flat washers where head or nut bears against wood.

E. Lag screws and lag bolts: ANSI/ASME B18.2.1, mild carbon steel with a minimum tensile strength of 60,000 psi. Furnish with ASTM F844 flat washers where head or nut bears against wood. Lubricate prior to installation.


G. Threaded rod: ASTM A36 or SAE 1018, continuously threaded mild steel rod.

H. Plate washers: Mild steel, size and thickness to match Simpson BP series bearing plates.

I. Powder driven fasteners: ICC or IAPMO Evaluation Service approved for anchorage of interior, nonshear wall applications. Pins shall be minimum 0.137 inch diameter, have minimum 1 inch diameter washers to accurately control penetration and minimum 1 inch penetration in concrete. Fasteners shall be installed by low-velocity power-actuated tool. Acceptable manufacturers: Hilti, Inc., Powers Fasteners, Inc., or approved equal.


2.4 MISCELLANEOUS

A. Glue: Conform to APA AFG-01.

B. Metal cross bridging: Manufacturer’s standard product, from not less than 16 gauge, G60 galvanized sheet steel. Bridging shall be compression type, lodged into or nailed to wide faces of adjacent joists near top and bottom to form an X.
PART 3 – EXECUTION

3.1 FRAMING
   
   A. Construct light framing according to CBC Section 2308, “Conventional Light Frame Construction”, where not otherwise indicated or specified.

   B. Make proper provisions for work of other trades. Lay out framing to accommodate plumbing, electrical, HVAC and other trades.

   C. Fasten as indicated. Locate fasteners to avoid knots, splits and areas of non-uniform grain. Select and/or trim members to be free of defects at major connections.

   1. Fasten framing connectors with fasteners through all holes for maximum load capacity.

   D. Perform cutting, boring and notching of wood members to avoid weakening of members. Obtain approval of Owner’s Representative to exceed typical limitations shown on Drawings. Use proper tools to make cut neat holes of appropriate size. Repair damaged members with metal plates or replace, as directed by Owner’s Representative.

   E. Joist framing:

   1. Provide joists of the sizes and spaces indicated, accurately and in alignment. Set joists with the crown edge up with full bearing on supports.

   2. Provide doubled floor joists under partitions running parallel with the joists. Where necessary for passage of pipes or ducts, space doubled joists as required for pipe or duct clearance and install solid blocking between joists at 4 feet on center and nail securely.

   3. Where openings occur, headers and supporting joists shall be doubled and headers and tail joists shall be hung on metal hangers.

   4. Lap joists over bearing only, not less than 12 inches, and face nail. Joists may butt over bearing, where each joist bears a minimum of 2 inches on support. Provide 2x scab matching joist depth, 24 inches long, face nailed to each. Install solid blocking over all supports.

   5. Provide metal hangers for joists framing to sides of headers, beams and ledgers.

   6. Provide metal bridging at 8 foot maximum spacing.

   F. Rafter framing:

   1. Provide rafters of the sizes and spaces indicated, accurately and in alignment. Set rafters accurately to form a true plane.

   2. Provide headers and trimmers around openings in the roof. Headers and trimmers carrying or supporting two or more rafters shall be doubled.

   3. Notch rafters to provide minimum 2-inch bearing on plates and secure with not less than 3-8d toenails. Provide full bearing at ridge valley and hip members and secure with metal framing clips.

   4. Ridge, valley, and hip members shall be of depth equal to the cut depth of rafters and 3x minimum thick. Provide sloped and skewed metal hangers for rafters framing to sides.

3.2 FLOOR AND ROOF SHEATHING

A. General

   1. Place panels with end joints staggered and bearing firmly on supports.

   2. Provide 1/8-inch space at panel edge and end joints.

   3. Place nails not less than 3/8 inches from panel edges and drive solidly into support. Drive head flush with surface of sheathing panel; do not overdrive.

   Rough Carpentry
   06 10 00 -5
4. Hold ends and edges back 1/2 inch from concrete or masonry surfaces. Where sheathing is applied over concrete or masonry, provide 1/2 inch minimum air space behind panel.

B. Floor sheathing
1. Place panels with face grain perpendicular to supports, continuous over at least 2 spans, with end joints staggered.
2. Back square edges with blocking at least 1-1/2 inches thick.
3. Apply continuous line of glue on joists and blocking and in grooves at tongue and groove joints, and nail as shown.

C. Roof sheathing
1. Place panels with face grain perpendicular to supports, continuous over at least 2 spans, with end joints staggered, unless otherwise shown.
2. Back edges with minimum 2 x 4 flat blocking, except provide minimum 3 x 4 blocking where panel edge nailing is 3 inches or less.

D. Roof sheathing applied over wood decking
1. Place panels with face grain perpendicular to decking with end joints staggered. Trim panels as required to locate end joints 1 inch minimum from edges of sheathing board below (1-1/2 inches at groove side of decking board).
2. Nail panel ends and edges at spacing shown. Provide nails at 16 inch maximum spacing at center of each decking board at panel interior, staggered. Use nails of suitable length to avoid penetration of decking.
3. Nail plywood to framing below, with minimum 3-1/2 inch long nails, where specifically shown or noted on Drawings.

3.3 CONNECTORS AND FASTENERS

A. General: Install in accordance with provisions of the CBC, applicable ICC Evaluation Service Reports, and industry practice.

B. Nailing: Where nailing is not indicated, conform to CBC Table 2304.9.1 and CBC Section 2308 requirements for Conventional Light-Frame Construction. When wood tends to split with size of nail used, predrill holes.

C. Bolting:
1. Holes size in wood shall be bolt diameter plus 1/16 inch.
2. Provide all bolts and lag screws bearing on wood with cut washers except where plate washers are indicated on the Drawings.
3. Retighten bolted connections before final acceptance or, in the case of bolted connections in concealed locations, immediately before the area is sealed off.

D. Metal framing connectors: Install connectors in accordance with manufacturer’s ICC Evaluation Service Report, except as otherwise designated. Use nails specially manufactured for use with connection hardware being employed.

3.4 FURRING, NAILERS AND BACKING

A. Wood grounds, nailers, blocking and sleepers:
1. Provide wherever indicated and where required for attachment of other work. Form to shapes as indicated and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach to substrates as required to support applied loading. Install fasteners flush with surfaces, unless otherwise indicated.
B. Wood furring: Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work. Firestop furred spaces with wood blocking or noncombustible materials, accurately fitted to close furred spaces.

C. Backing: Anchor to studs with nails or screws as required to support and back up finish carpentry, casework, flashing, fittings, fixtures, specialty items, accessories, mechanical and electrical work and items of similar nature.

3.5 PROTECTION

A. Protect framing that will remain exposed-to-view in completed construction from exposure to rain following installation.

3.6 FIELD QUALITY CONTROL

A. Inspection and testing will be performed in accordance with procedures and administrative requirements of Division 01 Section "Quality".

B. Testing Laboratory will:
   1. Special Inspect Seismic Lateral Force Resisting System in accordance with 2016 CBC Section 1705.12.2.

END OF SECTION
SECTION 07 21 01
BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Acoustical insulation.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
   1. Section 06 10 00 - Rough Carpentry: Provision of rough carpentry.
   2. Section 09 29 00 - Gypsum Board: Provision of gypsum board.
   3. Section 09 51 00 - Acoustical Ceilings: Provision of acoustical ceilings.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials

B. CALGreen - California Green Building Standards, 2016 Edition

C. UL - Underwriters Laboratories Inc.

1.3 DEFINITIONS

A. Thermal Resistivity: Where the thermal resistivity of insulation products are designated by "r-values", they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees Fahrenheit between the 2 exposed faces required to cause 1 BTU to flow through 1 square foot per hour at mean temperatures indicated.

1.4 SYSTEM DESCRIPTION

A. Insulation used on the Project shall comply with CALGreen Code Nonresidential Voluntary Measures Appendix A5, Division A5.5, Section A5.504, Articles A5.504.4.8 and A5.504.4.8.2.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data for insulation products specified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect fiberglass and acoustical materials from moisture during storage and installation.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Acoustical Insulation: Unfaced, 3-1/2 inches thick, friction-fit, flexible batt or blanket of fiberglass, formaldehyde-free, width to fit stud space, thickness as indicated to completely fill stud cavity, and conforming to ASTM C665, Type I, non-combustible when tested in accordance with ASTM E136.
   1. Fire resistive requirements when tested in accordance with ASTM E84:
      b. Smoke Developed: 50.
   2. Product: As manufactured by Owens Corning, “EcoTouch® PINK® FIBERGLAS™ Insulation with PureFiber® Technology”; Johns Manville, or equal.


C. Accessories
   1. Insulation Support: Galvanized springwire as required.
   2. Undersink Pipe Insulation: Provide undersink supply and drain pipe insulation, as manufactured by Truebro, Inc., “Basin Guard”; IPS Corporation, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Apply insulation units to substrate by method indicated, complying with manufacturer’s recommendations. If no specific method is indicated, use mechanical anchorage to provide permanent placement and support of units.

B. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.

C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness. Avoid crinkling and bending so that final installation is flat and smooth.

D. Install spindle fasteners at metal deck insulation in accordance with manufacturer’s written instructions.

3.2 INSTALLATION OF ACOUSTICAL INSULATION

A. Install batt insulation as indicated on the Drawings and as directed below.

B. Install batt insulation above all suspended gypsum board ceilings.

C. Install batt insulation to fill framing cavities and fasten to framing to prevent slipping at sound-rated construction.

D. Install insulation batts around perimeter of piping and electrical boxes in sound-rated wall/ceiling cavities.
E. Install insulation batts in built-up plywood floor/steps; thickness 6 inches.

F. Pack sound insulation batts around perimeter of bathtubs.

G. At all exposed conditions in occupiable spaces, provide edge trim at edges of wall installations. Insulation shall not be visible at joints between adjacent panels.

3.3 INSTALLATION OF BLACK-FACED INSULATION

A. Install black-faced insulation on stick-clips with black protective caps, using contact adhesive, as manufactured by 3M, “77N”, or equal, where installed on backing material. At all exposed conditions in occupiable spaces, provide edge trim at edges of all wall installations. Where the insulation is not black, it shall not be visible at joints between adjacent panels. Install between studs with proper attachment where indicated on the Drawings.

3.4 PROTECTION

A. General: Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION
SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Acoustical sealant.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
   1. Section 05 45 00 - Metal Support Assemblies: Provision of metal support assemblies.
   2. Section 09 29 00 - Gypsum Board: For sealants used in concealed perimeter joints of gypsum board partitions to reduce sound transmission.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials

B. CALGreen - California Green Building Standards, 2016 Edition

C. CFR - Code of Federal Regulations

D. EPA - Environmental Protection Agency

1.3 SYSTEM DESCRIPTION

A. Performance Requirements
   1. Provide joint sealers that have been manufactured to establish and maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
   2. Sealants used on the Project shall comply with CALGreen Code Nonresidential Mandatory Measures, Chapter 5, Division 5.5, Section 5.504, Article 5.504.4.1.

1.4 SUBMITTALS

A. Product Data: Submit product data from manufacturers for each joint sealant product required.

B. Samples: Provide “dot” samples for verification purposes of each type and color of joint sealant required.
   1. Submit samples of all standard colors of sealant which is not paintable.

PART 2 – PRODUCTS
2.1 MATERIALS

A. General Requirements
1. Provide joint sealers compatible with one another and with substrates.
2. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
   a. Sealants: 250 g/L.
   b. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Manufacturer's standard color range shall permit matching sealants to color of contacting surfaces and future ability to paint.

B. Acoustical Sealant
1. Non-hardening, non-skinning, for use in conjunction with gypsum board.
2. Provide range of colors for paintable surfaces.

2.2 ACCESSORIES

A. Primer: Non-staining type recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ASTM D1056 round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width as recommended by manufacturer of sealant material.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Installation of Sealant Joint Backings: Install sealant joint backings to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   a. Do not leave gaps between ends of joint fillers.
   b. Do not stretch, twist, puncture, or tear joint fillers.
   c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints for 2 opposing side adhesion only.

E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.

G. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer’s directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer’s recommendations.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Vertical actuation bar to replace existing ADA-door operator boxes.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Section
   1. Division 26 - Electrical: Provision of electrical connections, including power and switching.

1.2 REFERENCES

A. ADA - Americans with Disabilities Act

B. BHMA - Builders Hardware Manufacturers Association
   1. A156.10 - Power Operated Pedestrian Doors.

C. UL - Underwriters Laboratories Inc.
   1. 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Provide automatic entrance door system that complies with performance requirements indicated.
   1. Wind Loads: Provide automatic entrance door assembly capable of withstanding wind pressures of 20 psf inward and 20 psf outward acting normal to the plane of the wall.

B. Performance Requirements
   1. General: Provide automatic entrance door assembly that complies with performance characteristics specified as demonstrated by testing the manufacturer’s corresponding stock assemblies according to test methods indicated.
   2. Thermal Movement: Design the automatic entrance door system to provide for expansion and contraction of the component materials. Door shall function normally over the specified temperature range.
      a. The system shall be capable of withstanding a metal surface temperature range of 180 degrees Fahrenheit without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass or other detrimental effects.
   3. Operator: Provide operator that will open and close the door and maintain it in fully closed position when subjected to a 20 mph wind velocity or the equivalent inward differential pressure.

1.4 SUBMITTALS

A. Product Data: Submit product data for automatic entrance, including the manufacturer’s standard details and fabrication methods and the following:
   1. Data on operators, hardware and accessories.
2. Roughing-in diagrams.
3. Parts lists.
4. Data on finishes and recommendations for maintenance and cleaning of exterior surfaces.

B. Shop Drawings: Submit shop drawings for automatic entrance, including:
1. Layout and installation details, including relationship to adjacent work.
2. Elevations at 1/4-inch = 1 foot scale.
3. Detail sections of typical composite members.
4. Anchors and reinforcement.
5. Hardware mounting heights.
6. Power requirements and wiring.

C. Submit wiring diagrams detailing wiring for power operator, signal and control systems differentiating clearly between manufacturer installed wiring and field installed wiring.

D. Quality Control Submittals: Provide certified test reports from a qualified independent testing laboratory showing that automatic entrance door systems have been tested in accordance with specified test procedures and comply with performance characteristics indicated.

E. Contract Closeout Submittals: Submit manufacturer’s maintenance and service data for door operators and control system including the name, address and telephone number of the nearest authorized service representative.

1.5 QUALITY ASSURANCE

A. BHMA Standard: Provide automatic entrance door unit that complies with applicable requirements of BHMA A156.10.

B. UL Standard: Provide powered door operators that comply with UL 325.

C. Emergency Exit Door: Automatic entrance door serving as a required means of egress shall comply with requirements of authorities having jurisdiction. Provide manufacturer’s certification that door complies with these requirements.

1.6 PROJECT CONDITIONS

A. Overhead door mechanism for opening door pair is existing. Contractor shall confirm doors open appropriately with existing operator prior to starting work on installation of new vertical actuation bar.

B. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the Work.
   1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.7 WARRANTY

A. Warranty: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace components of the automatic entrance door system that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:
   a. Structural failures including excessive deflection, excessive leakage or air infiltration.
   b. Faulty operation of operators and hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
B. Warranty Period: 3 years after the date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to, and runs concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Ingersoll Rand, “LCN Full Length Actuator, #8310-836T”, or equal.

2.2 HARDWARE

A. Provide low profile vertical actuation bar for wired applications at surface-mounted and recess-mounted wall locations indicated.
   1. Actuation Area: 36 inches by 6 inches.
   4. Membrane Switch Material: 3M 7993MP.
   6. Face Plate: Stainless steel.
   8. End Cap Material: UL94 ABS.

2.3 FABRICATION

A. General: Fabricate entrance door system components to design, sizes, and thicknesses indicated and to comply with indicated standards.

B. Prefabrication: Provide entrance door operator as prefabricated packaged unit.

C. Reinforce the work as necessary for performance requirements and for support to the structure. Separate metal surfaces at moving joints with nonmetallic separators to prevent “freeze-up” of joints.

D. Dissimilar Metals: Separate dissimilar metals with bituminous paint, a suitable sealant, nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.

E. Maintain continuity of line and accurate relation of planes and angles. Provide secure attachment and support at mechanical joints, with hairline fit of contacting members.

F. Fasteners: Conceal fasteners wherever possible.

G. Provide concealed electrical wiring and conduit as required for operation.

PART 3 - EXECUTION

3.1 PREPARATION
A. Templates and Diagrams: Furnish templates, diagrams, and other data to fabricators and installers of related work, as necessary, for coordination of the automatic entrance door installation.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations.

B. Set units plumb, level and true to line without warp or rack of frames or door. Anchor securely in place. Separate aluminum and other corrosible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

C. Install complete door operator system in accordance with manufacturer's instructions, including piping, controls, control wiring and remote power units.

D. Set tracks, header assemblies, operating brackets, rails and guides level and true to location with adequate anchorage for permanent support.

3.3 ADJUSTING

A. After repeated operation of completed installation, equivalent to 3 days use by normal traffic (100 to 300 cycles), readjust door operators and controls for optimum operating condition and safety and for a weathertight closure. Lubricate hardware, operating equipment, and other moving parts.

3.4 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that entrance door operator will be without damage or deterioration, other than normal weathering, at the time of acceptance.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Gypsum board screw attached to metal framing and furring members, joint treatment and accessories.
2. Installation of sound deadening insulation in walls and ceilings and including acoustical sealant, tape and the like for work of this Section.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
1. Section 07 21 01 - Building Insulation: Provision of acoustical insulation.
2. Section 07 92 00 - Joint Sealants: Provision of caulk and sealants.
3. Section 09 90 00 - Painting and Coating: For finish painting.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials
4. C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

B. CBC - California Building Code, 2016 Edition

C. CFR - Code of Federal Regulations

D. EPA - Environmental Protection Agency

E. GA - Gypsum Association
1. 201 - Using Gypsum Board for Walls and Ceilings.
2. 214 - Recommended Levels of Gypsum Board Finish.

F. UL - Underwriters Laboratories Inc.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s product data. Include required fire test results for gypsum board systems on partitions and ceilings.

B. Samples: Manufacturer’s standard size for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

A. Fire Test Response Characteristics: Where fire resistance rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:
   1. Fire Resistance Ratings: As indicated by GA File Numbers in GA 600 or design designations in UL FRD or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
   2. Gypsum board assemblies indicated are identical to assemblies tested for fire resistance according to ASTM E119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS


2.2 MATERIALS

A. Gypsum Board: Fire rated board for fire resistance rated assemblies, ASTM C1396, Type X, tapered edges, 48 inches wide, 5/8-inch thick.
   1. Provide 1/2-inch thick board where indicated on the Drawings to align with existing.

B. Screws: ASTM C1002, machine thread for gypsum board to metal attachments.

C. Nails: ASTM C514, wood thread for metal or gypsum board attachment to wood.

D. Adhesives: Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Accessories
   2. Reveal Trim: As manufactured by Fry Reglet Corporation, or equal.

F. Joint Treatment Materials: Products of one manufacturer conforming to ASTM C475, ASTM C840, and recommendations of manufacturer of both gypsum board and joint treatment materials for application indicated. Conform to GA 201 and GA 216 for reinforcing tape, joint compound, and water.
   1. Joint Tape
      a. Cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape as recommended by setting type joint compound manufacturer.
b. For silicone treated gypsum backer board, use 2 inch wide, 10-inch by 10-inch woven glass mesh tape.

2. Setting Type Joint Compound: Factory prepackaged, job mixed, chemical hardening powder products formulated for uses indicated or factory premixed product. Use hot type at exterior gypsum soffits.

G. Acoustical Sealant: As specified in Section 07 92 00.

2.3 FINISHES

A. General: Apply joint treatment at gypsum board joints (both directions), flanges of corner bead, edge trim and control joints, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.

1. Prefill open joints and rounded or beveled edges, if any, using setting type joint compound.
2. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

B. Levels of Gypsum Board Finish as Defined by GA 214. Levels are only examples and do not constitute a schedule of finish. See Interior Finish Schedule for levels of finish.

1. Level 0: No taping, finishing, or accessories required.
2. Level 1: All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
   a. Provide at Exhibit Hall storage above dropped ceiling.
3. Level 2: All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
4. Level 3: All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of finish finishes.
   a. Provide at high, exposed areas of Exhibit Hall.
5. Level 4: All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of finish finishes.
6. Level 5: All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer’s recommendations, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of finish paint.
   a. At Showcase Theatre, skim coat entire ceilings surface.
   b. At Offices, blend with existing ceiling where adjacent.

C. The finished gypsum board should present a smooth, unblemished, homogenous appearance with inconspicuous joining between boards and no visible fasteners. There should be no areas...
of raised fibers on the face paper due to over sanding. Visible fastener pops, seam lines and cracks within the first year will be corrected as required by the guarantee.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Gypsum Board
   1. Install and finish gypsum board to comply with ASTM C840 or GA 216.
      a. Single Layer: Install in accordance with ASTM C840, except as amended or required by specific fire resistive or sound isolation system detailed. In that instance, application shall conform to requirements of the manufacturer's tests as reviewed and accepted in the submittal.
      b. Double Layer: Conform to applicable portions of ASTM C840, System Classification VIII for installations applied with screws. Conform to required fire resistance standards.
   2. Apply in horizontal direction with ends and edges falling on supports. Gypsum board shall be of maximum length possible to reach full wall or ceiling lengths with minimal number of joints.
   3. Position boards so that like edges abut, tapered edges against tapered edges and field cut ends against field cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
   4. Start installation of panels at exterior wall to position butt joints as far away from exterior wall as possible.

B. Fire Resistant Assemblies: Wherever fire rated gypsum board construction is indicated, provide materials and installation methods, including types and spacing of fasteners, in accordance with CBC, GA Manual, or listed assembly indicated. Apply firestopping at top of wall and at penetrations through fire resistant assembly in accordance with CBC.

C. Sound Retardant Installations: Provide sound retardant insulation at all changing, toilet, and shower stall walls. Follow manufacturer's directions and specifications for conditions of installation. Install from floor surface to bottom side of next floor surface.
   1. Wrap with insulation and Lowry Pads and seal electrical or other outlets in sound isolating partitions.
   2. Seal perimeter and penetrations at sound-rated construction to meet specific project acoustical requirements.
   3. Install sealant to completely fill void between gypsum board edges and adjacent surface.

D. Fastenings: Attach gypsum board to framing with screws, lengths and sizes as recommended by manufacturer and in accordance with CBC.

E. Accessories
   1. Install corner beads at vertical and horizontal external corners; tape inside corners.
   2. Install casing beads whenever edge of gypsum board would otherwise be exposed or semi-exposed, or where abutting dissimilar materials.
   3. After accessories are installed, correct surface damage and defects.
   4. Install trims and expansion joints where required.

F. Construction Tolerances
   1. Gypsum board surfaces to be painted shall have no measurable variation in any 2 feet-0 inches direction and a maximum variation of 1/8-inch in 10 feet-0 inches when a straightedge is laid on the surface in any direction.
   2. Coordinate with tolerances required for surfaces to receive tile.
3. Do not exceed 1/16-inch offset between planes of abutting sheets at edges or ends.
4. Shim panels as necessary to comply with tolerances.

3.2 FINISHING OF GYPSUM BOARD

A. Apply joint treatment at gypsum board joints; flanges of corner bead, edge trim and penetrations, fastener heads and surface defects in accordance with ASTM C840 or GA 216. Number of coats of treatment shall be as specified above.

B. Finish Painting: As specified in Section 09 90 00.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Suspended ceiling systems.
1. Alternate #1 - Exhibit Hall High Ceiling: Revise finishes after completion of structural work as indicated on the Drawings.
2. Alternate #2 - Exhibit Hall Ceiling Bulkhead and Soffit, North and South: Revise finishes and construction after completion of structural work as indicated on the Drawings.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
1. Section 01 23 00 - Alternates: For alternates.
2. Section 07 21 01 - Building Insulation: Provision of black-faced insulation.
3. Section 09 90 00 - Painting and Coating: For finish painting.
4. Division 26 - Electrical: Provision of electrical work to be performed above suspended ceilings.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials
2. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
5. E1264 - Classification for Acoustical Ceiling Products.

B. CBC - California Building Code, 2016 Edition

C. UL - Underwriters Laboratories Inc.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Architectural reflected ceiling plan drawings shall govern over Mechanical and Electrical Drawings.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer’s product data completely describing products.

B. Shop Drawings: Show complete ceiling layouts, seismic bracing methods and details of installation, and information required for related work.

C. Samples: 1 panel of each type of acoustical material specified.
D. Quality Control Submittals
1. Manufacturer’s Instructions: Submit manufacturer’s installation instructions.
2. Certification: Provide manufacturer’s signed statement that gypsum board materials are asbestos free.

1.5 QUALITY ASSURANCE
A. Qualifications: Installer shall have completed at least 3 previous projects of similar size and complexity.
B. Regulatory Requirements: Install fire rated ceiling systems in accordance with CBC and UL FRD listing and requirements of agency having jurisdiction.

1.6 DELIVERY, STORAGE AND HANDLING
A. Packing and Shipping: Deliver and store packaged products in original containers with seals unbroken and labels intact until time of use.
B. Storage and Protection
   1. Keep materials dry by storing off ground; under watertight covers.
   2. Immediately before installation, panels shall be stored for sufficient time to stabilize temperature and humidity conditions ambient during installation and anticipated for occupancy.

1.7 PROJECT CONDITIONS
A. Environmental Requirements: Do not begin work until residual moisture has dissipated and comply with the following:
   1. Acoustical Ceilings: Maintain uniform temperature of minimum 60 degrees Fahrenheit and maximum of 90 degrees Fahrenheit and humidity of 20 to 40 percent but no more than 90 percent prior to, during and after installation.

1.8 SEQUENCING AND SCHEDULING
A. Schedule installation of acoustic units after interior wet work is dry.
B. Coordinate installation of ceilings with mechanical and electrical work.

1.9 MAINTENANCE
A. Extra Materials: Provide 5 percent extra quantity of each type of acoustical surface installed. Provide in original unbroken containers plainly marked with type and quantity of contents.

PART 2 - PRODUCTS
2.1 MATERIALS
A. Suspended Acoustical Ceiling Systems
   1. Installation
      a. System 1 - Base Bid: Installed horizontally at ceiling and canted at fascia, approximately 15 degrees off vertical; exposed tees; match existing layout.
      b. System 2 - Alternate #2: Installed horizontally at ceiling; tegular exposed tees.
   2. Panels: Moisture resistant wet formed mineral fiber with factory applied vinyl latex paint, mildew resistant, and with the following properties:
a. Dimensions
   1) System 1: 48 inches by 48 inches.
   2) System 2 - Alternate #2: 24 inches by 48 inches.

b. Thickness
   1) System 1: 1 inch.
   2) System 2 - Alternate #2: 5/8-inch or 3/4-inch.

c. Light Reflectance: Minimum LR 0.90 in accordance with ASTM E1264.

d. NRC Range: 0.90.

e. Edge: Square tegular.

f. Surface Burning Characteristics: Class A in accordance with ASTM E84, with flame spread 25 or under.

g. Color: White.
   1) System 2 - Alternate #2: Provide black panels in lieu of white panels.


3. Mechanical Suspension System: Intermediate-duty, non-fire rated, exposed grid system for routed edge ceiling panels, double-web tees, steel body with exposed surfaces factory painted with baked polyester paint.
   a. Provide panel centering devices built into each grid member.
   b. Pull out tension values greater than 300 pounds.
      1) System 2 - Alternate #2: Provide black exposed framing in lieu of white exposed framing.
   d. Width: 15/16-inch, unless otherwise indicated.

B. Black-Faced Insulation: As specified in Section 07 21 01.

C. Fasteners and Attachments
   1. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft temper, with gauge in accordance with CBC.
   2. Angle-Type Hangers: Angles with legs not less than 7/8-inch wide, formed from 0.0635-inch thick galvanized steel sheet complying with ASTM A653, G90 Coating Designation, with bolted connections and 5/16-inch diameter bolts.
   3. Ceiling Clips: Minimum 13 gauge by 3/4-inch wide, as manufactured by Hilti, "Ceiling Clips", or equal.
   4. Light Fixture Protection and Hold Down Clips: Provide light fixture protection panels, fasteners and hold down clips as required by UL FRD listing, manufacturer’s standard types.

D. Non-Bridging Paint: As specified in Section 09 90 00.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive acoustical treatment and verify that:
   1. Installation of building components located in ceiling plenum is complete.
   2. Spacing, direction and details of grid members and supports to accommodate installation of light fixtures, diffusers and other ceiling located items are correct.
   3. Areas are clean and free of materials or rubble that could damage acoustical surfaces.

B. Do not start work until unsatisfactory conditions are corrected.
3.2 INSTALLATION

A. Suspended Ceiling Systems
1. Install acoustical material and suspension system, including necessary hangers and other supporting hardware in accordance with manufacturer’s instructions and ASTM C636.
2. Lay work out symmetrically about centers of rooms and provide symmetrical borders not less than half size of tile specified unless noted otherwise on the Drawings.
3. Make penetrations through ceiling panels in such a manner to ensure tight fit and neat appearance. Center penetrations in tile unless otherwise noted.

B. Suspension System
1. Install in accordance with CBC.
2. For Hanger and Lateral Bracing Wires: Install expansion bolts or ceiling clips as required.
3. Hanger Wires
   a. Insert hanger wires around expansion bolts or through ceiling clips in accordance with Code and secure as specified for hanger wires following in this Article. Load test hanger wires as specified in Article titled “Field Quality Control” in this Section.
   b. Plumb hanger wires. Add counterbrace wires when hanger wires are more than 1 in 6 out of plumb.
4. Provide additional metal framing and hanger wires to clear furred-area interferences with suspension system. Do not penetrate ductwork with hanger wires.
5. Ceiling wires and unbraced ducts, pipes and similar type items shall be separated by at least 6 inches.
6. Provide hanger wires at intersection of grid members.
7. Provide hanger wire supports for all recessed light fixtures and mechanical items as required for total support independent of acoustical ceiling systems.
8. Use of scrap or short-cut members is not permitted.
9. Connect grid members with positive interlocking method as standard with reviewed manufacturer.
10. Secure ends of suspension system members at 2 adjacent walls as indicated and leave floating at other 2 adjacent walls.
11. Interconnect carriers over 12 inches not interconnected to walls near free end with 16 gauge tie wire or a metal strut securely attached to prevent spreading.
12. Level grid assembly in each area after installation of mechanical and electrical equipment within 1/8 inch in 12 inches or conforming to slope as appropriate to area of installation.

C. Prepare acoustical ceiling panels for painting with non-bridging paint specified in Section 09 90 00.

3.3 FIELD QUALITY CONTROL

A. Acoustical Ceiling Connection Devices: Test devices for capability to support the following loads:
   1. Hanger Wires: 100 pounds in accordance with requirements of CBC.
   2. Lateral Force Bracing Wires: 200 pounds or actual design load whichever is greater, with safety factor of 2, in accordance with CBC.

3.4 CLEANING AND ADJUSTING

A. Remove damaged or soiled material and replace with new prior to the Owner’s acceptance of Project.

3.5 PROTECTION

A. Protect acoustical treatment installation from damage during remainder of construction.
END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Suspended wood ceiling system installed as fascia as indicated on the Drawings.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
   1. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC): Provision of HVAC work penetrating suspended ceiling system.
   2. Division 26 - Electrical: Provision of electrical work penetrating suspended ceiling system.

1.2 REFERENCES

A. CBC - California Building Code, 2016 Edition

B. FSC - Forest Stewardship Council

C. UL - Underwriters Laboratories Inc.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Architectural reflected ceiling plan drawings shall govern over Mechanical and Electrical Drawings.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data completely describing products, including fire rating data.

B. Shop Drawings: Show plan layout and details.

C. Samples: Submit for approval a minimum 12-inch by 12-inch wood ceiling sample, in specified plank style, with finish applied.

D. Field Submittals
   1. Quality Control Submittals: Submit manufacturer’s installation instructions.
   2. Qualifications: Installer shall have completed at least 3 previous projects of similar size and complexity.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Install fire rated ceiling systems in accordance with CBC and UL FRD listing and requirements of agency having jurisdiction (minimum Class C fire rating).
1.6 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver and store packaged products in original containers with seals unbroken and labels intact until time of use.

B. Storage and Protection
1. Keep materials dry by storing off ground; under watertight covers.
2. Immediately before installation, planks shall be stored for sufficient time to stabilize temperature and humidity conditions ambient during installation and anticipated for occupancy.
3. Panels: Store flat and level in a fully enclosed space. Store panels in the room in which they will be installed for a minimum 72 hours immediately prior to ceiling installation. The temperature and humidity of the room shall closely approximate those conditions that will exist when the building is occupied. Panels must be stored off the floor.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Do not begin work until residual moisture has dissipated. Maintain uniform temperature of minimum 60 degrees Fahrenheit and maximum of 90 degrees Fahrenheit and humidity of 20 to 40 percent but no more than 90 percent prior to, during, and after installation.

1.8 SEQUENCING AND SCHEDULING

A. Schedule installation of wood ceilings after interior wet work is dry.

B. Coordinate installation of ceilings with mechanical and electrical work.

1.9 MAINTENANCE

A. Extra Materials: Provide 5 percent extra quantity of each type of wood ceiling installed. Provide in original unbroken containers plainly marked with type and quantity of contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Armstrong World Industries, “WOODWORKS Grille®, Item Number 7263BO”, or equal.

2.2 SUSPENDED WOOD CEILING SYSTEM

A. Panels: Smooth wood backer and dowel combination.
   1. Edge: Backer, 15/16-inch.
   2. Dimensions: 12 inches by 96 inches by 1-7/8 inches.
   4. Acoustics: 0.90 NRC.
   5. Finish: As selected by the Architect.

B. Mechanical Suspension System: Intermediate-duty, non-fire rated, exposed grid system for routed edge ceiling panels, double-web tees, steel body with exposed surfaces factory painted with baked polyester paint.
   1. Provide panel centering devices built into each grid member.
   2. Pull out tension values greater than 300 pounds.
3. Color: As selected by the Architect.
5. Product: As manufactured by Armstrong World Industries, "15/16-Inch Heavy Duty Prelude XL", or equal.

C. Attachments: Manufacturer’s standard.

D. Edges, Borders, and Perimeter Trims: Manufacturer’s standard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive wood ceilings and verify that:
   1. Installation of building components located in ceiling plenum is complete.
   2. Areas are clean and free of materials or rubble that could damage wood ceiling surfaces.

B. Do not start work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install materials in accordance with ceiling system manufacturer’s written instructions. Comply with applicable regulations and industry standards.

B. Install panels vertically on studs as indicated on the Drawings. Lay out and install perimeter trim as specified.

C. Suspensions: Install suspension systems to comply with appropriate industry standards. Locate cliprails perpendicular to wood direction, 4 inches from one wall for the first cliprail, continuing 24 inches maximum, on center, ending within 4 inches of the opposite wall; 12 gauge wire hangers shall be installed 4 feet on center, along each cliprail. The wire hangers shall be attached to inserts, screw eyes, or other connecting devices that are secure and appropriate for suspending the ceiling and that will not deteriorate or fail with age or elevated temperatures.
   1. Provide Unistrut system as necessary to hang suspension system where existing equipment blocks direct access to concrete slab above.

D. Wood Strip Installation: Snap wood strips onto cliprails using ceiling system manufacturer’s standard clamping tool. The clips, which are attached to the cliprail, have projections that insert into grooves cut into the back side of the wood strips. Proper tool adjustment is important to assure that the clips achieve a deep seat within the wood grooves. Installation shall proceed, in sequence, from one wall to the opposite side.
   1. When installing ceilings with fiberfelt spacer, hang wood strips with felt edge facing the area yet to be filled.

E. HVAC and Light Fixture Suspensions: Electrical and mechanical installations shall be supported independently of the linear wood ceiling system.
   1. Coordinate installation of wood ceiling and light fixture at wood ceiling.

3.3 CLEANING AND ADJUSTING

A. Remove damaged or soiled material and replace with new prior to the Owner's acceptance of Project.

3.4 PROTECTION
A. Protect wood ceiling installation from damage during remainder of construction.

END OF SECTION
SECTION 09 68 00

CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Installation of Owner-furnished carpet where required for patching of existing.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Section
   1. Section 06 10 00 - Rough Carpentry: Provision of rough carpentry.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials
   5. F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

B. BAAQMD - Bay Area Air Quality Management District

C. CALGreen - California Green Building Standards, 2016 Edition

D. CRI - Carpet and Rug Institute
   1. 104 - Standard for Installation of Commercial Carpet.

E. FCICA - Floor Covering Installation Contractors Association

F. SCAQMD - South Coast Air Quality Management District

1.3 SYSTEM DESCRIPTION

A. Performance Requirements
   1. Adhesives used on the Project shall comply with CALGreen Code Nonresidential Mandatory Measures, Chapter 5, Division 5.5, Section 5.504, Article 5.504.4.1.
   2. All interior sealants used as fillers shall meet or exceed the BAAQMD Reg. 8, Rule 51 VOC requirements; all interior adhesives and other types of sealants shall meet or exceed the SCAQMD Rule 1168 VOC requirements.
1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing layout and seaming diagrams. Indicate pile or pattern direction and locations and types of edge strips. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Show installation details at special conditions.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by FCICA or who can demonstrate compliance with its certification program requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site: Receive Owner-furnished materials at Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.

B. Storage and Protection: Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground. Maintain minimum temperature of 68 degrees Fahrenheit at least 3 days prior to and during installation in area where materials are stored.

1.7 PROJECT CONDITIONS

A. Substrate Conditions: No condensation within 48 hours on underside of 4 feet by 4 feet polyethylene sheet, fully taped at perimeter to substrate; pH of 9 or less when substrate wetted with potable water and pHydron paper applied.

B. Environmental Limitations: Comply with CRI 104, Section 6.1. Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carpet: As supplied by the Owner to match existing.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended by carpet manufacturer for releasable installation.

1. VOC Limits: Provide adhesives that comply with the following limits for VOC content when tested according to ASTM D5116.

   a. Total VOCs: 50 g/L.
   b. Formaldehyde: 0.05 mg/sq. m x h.
   c. 2-Ethyl-1-Hexanol: 3.00 mg/sq. m x h.

C. Trowelable Underlayments and Patching Compounds: Latex modified, portland cement based formulation provided or approved by resilient flooring manufacturer for applications indicated.
D. Self-Leveling Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in uniform thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
   2. Compressive Strength: Not less than 4,100 psi at 28 days when tested according to ASTM C109.

E. Transition Strip: Rubber, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Verify that substrates and conditions are satisfactory for carpet installation and comply with requirements specified.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710 and the following:
   1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by the resilient flooring manufacturer.
   2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
   3. Concrete shall be allowed to cure for 90 to 120 days and must be properly sealed. Test concrete for vapor emission by the Calcium Chloride Moisture test method in compliance with ASTM F1869. Emission rate shall not exceed 3 lb/24 hr/1000 sq. ft.

C. Please note that the existing concrete floor surface is rough; examine site conditions and provide bid to include necessary preparation and leveling; no additional charge shall be allowed after award of contract.

3.2 PREPARATION

A. General: Comply with CRI 104, Section 6.2, “Site Conditions; Floor Preparation”, and carpet manufacturer’s written installation instructions for preparing substrates indicated to receive carpet installation.

B. Clear away debris and scrape up cementitious deposits from concrete surfaces to receive carpet; apply sealer to prevent dusting.

C. Remove coatings, including curing compounds and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone without using solvents. Use mechanical methods recommended in writing by the carpet manufacturer.

D. Use trowelable leveling and patching compounds, according to manufacturer’s written instructions, to fill cracks, holes and depressions in substrates.

E. Seal powdery or porous surfaces with sealer recommended by carpet manufacturer.
F. Broom and vacuum clean substrates to be covered immediately before installing carpet. After cleaning, examine substrates for moisture, alkaline salts, carbonation or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

G. Unwrap and unroll carpet and cushion in a well ventilated location prior to installation. Air the carpet out in off-site location such as a ventilated warehouse for at least 2 days prior to installation.

3.3 INSTALLATION
A. Comply with manufacturer’s recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position; do not place seams perpendicular to door frame, in direction of traffic through doorway. Do not bridge building seismic joints with continuous carpet.

B. Extend carpet under removable flanges and furnishings and into alcoves and closets of each space.

C. Provide cutouts where required, and bind cut edges where not concealed by protective edge guards or overlapping flanges.

D. Install carpet edge guard where edge of carpet is exposed; anchor guards to substrate.

E. Install with pattern parallel to walls and borders.

F. Install carpet by trimming edges, butting cuts with seaming cement, and taping and/or sewing seams to provide sufficient strength for stretching and continued stresses during life of carpet.

3.4 CLEANING
A. Remove adhesive from carpet surface with manufacturer’s recommended cleaning agent.


3.5 PROTECTION
A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, to ensure carpet is not damaged or deteriorated at time of Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation, painting, and finishing of all new and existing exposed interior items and surfaces, except prefinished items and unless otherwise indicated.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections
   1. Section 05 50 00 - Metal Fabrications: For finish painting of metal fabrications.
   2. Section 06 10 00 - Rough Carpentry: For finish painting of rough carpentry.
   3. Section 09 29 00 - Gypsum Board: For finish painting of gypsum board.
   4. Section 09 51 00 - Acoustical Ceilings: For finish painting of acoustical ceiling panels.

1.2 REFERENCES

A. ASTM - American Society for Testing and Materials

B. CALGreen - California Green Building Standards, 2016 Edition

C. CFR - Code of Federal Regulations

D. EPA - Environmental Protection Agency

E. FM - Factory Mutual

F. SSPC - The Society for Protective Coatings

G. UL - Underwriters Laboratories Inc.

1.3 DEFINITIONS

A. "Paint": As used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate or finish coats.

B. Standard coating terms defined in ASTM D16 apply to this Section.
   1. "Flat": Refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. "Eggshell": Refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. "Semigloss": Refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. “Full Gloss”: Refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SYSTEM DESCRIPTION

A. Performance Requirements
1. Paint exposed surfaces whether or not colors are designated in the schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
2. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts and labels.
3. Do not paint over UL, FM, or other code required labels or equipment name, identification, performance rating or nomenclature plates.

B. Paints and coatings used on the Project shall comply with CALGreen Code Nonresidential Mandatory Measures, Chapter 5, Division 5.5, Section 5.504, Article 5.504.4.3.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer’s product data for each paint system specified, including block fillers and primers.
1. Provide manufacturer’s technical information including label analysis and instructions for handling, storage and application of each material proposed for use.
2. List each material and cross reference the specific coating, finish system and application. Identify each material by the manufacturer’s catalog number and general classification.

B. Samples
1. Following the selection of colors and glosses by the Architect, submit samples for the Architect’s review.
   a. Provide 1 sample of each color and each gloss for each material on which the finish is specified to be applied.
   b. Except as otherwise directed by the Architect, make samples approximately 8 inches by 10 inches in size.
   c. Provide field mockups for each final paint color and texture approval in the form of actual application of the materials on actual surfaces to be painted for approval by the Architect. Areas shall be 4 feet by 4 feet.
   d. Allow for 1 additional mockup of each color.
2. In addition, revise and resubmit each sample or field mockup as requested until the required gloss, color and texture are achieved. Such samples or field mockups, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
3. Do not commence finish painting until approved samples are on file at the job site.

C. Quality Control Submittals: Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

1.6 QUALITY ASSURANCE

A. Provide primers and undercoat paint produced by the same manufacturer as finish coats.
1. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrates.
2. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
3. Provide barrier coats over non-compatible primers, or remove the primer and re-prime as required.
4. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime coatings supplied under other Sections.

B. Applicator Qualifications: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Mockups: Apply samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site: Deliver materials to the job site in manufacturer’s original, unopened packages and containers bearing manufacturer’s name and label and the following information:
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer’s stock number and date of manufacture.
   4. Contents by volume for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.

B. Storage and Protection
   1. Store materials not in use in tightly covered containers in well ventilated area at minimum ambient temperature of 45 degrees Fahrenheit. Maintain containers used in storage in clean condition, free of foreign materials and residue.
   2. Protect from freezing. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.8 PROJECT CONDITIONS

A. Environmental Requirements
   1. Apply water based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 degrees Fahrenheit, unless otherwise permitted by the manufacturers’ printed instructions as approved by the Architect.
   2. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees Fahrenheit, unless otherwise permitted by the manufacturers’ printed instructions as approved by the Architect.
   3. Do not apply paint in rain, fog, or mist; or when the relative humidity exceeds 85 percent. Do not apply paint to damp or wet surfaces, unless otherwise permitted by the manufacturers’ printed instructions as approved by the Architect.
   4. Applications may be continued during inclement weather only within the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

1.9 MAINTENANCE

A. Upon completion of the work of this Section, deliver to the Owner’s Project Manager an extra stock of 5 gallons of each color, type, and gloss of interior paint used in the Work, tightly sealing each container, and clearly labeling with contents and location where used.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Benjamin Moore; DuraSeal, or equal.

2.2 PAINT MATERIALS

A. General

1. Paint Materials, General: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer, based on testing and field experience.

2. Material Quality: Provide manufacturer’s best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer’s product identification will not be acceptable.

3. Chemical Components of Field-Applied Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:

   a. VOC Content of Interior Paints and Coatings: Not more than 5 g/L.

   b. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzenes).

   c. Restricted Components: Paints and coatings shall not contain any of the following:

      1) Acrolein.
      2) Acrylonitrile.
      3) Antimony.
      4) Benzene.
      5) Butyl benzyl phthalate.
      6) Cadmium.
      7) Di (2-ethylhexyl) phthalate.
      8) Di-n-butyl phthalate.
      9) Di-n-octyl phthalate.
      10) 1,2-dichlorobenzene.
      11) Diethyl phthalate.
      12) Dimethyl phthalate.
      13) Ethylbenzene.
      14) Formaldehyde.
      15) Hexavalent chromium.
      16) Isophorone.
      17) Lead.
      18) Mercury.
      19) Methyl ethyl ketone.
      20) Methyl isobutyl ketone.
      21) Methylene chloride.
      22) Naphthalene.
      23) Toluene (methylbenzene).
      24) 1,1,1-trichloroethane.
      25) Vinyl chloride.

4. Colors: As selected by the Architect from manufacturer’s full range.

2.3 APPLICATION EQUIPMENT
A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Architect.

B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.4 OTHER MATERIALS

A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Mix and prepare paint materials in strict accordance with the manufacturers’ recommendations as approved by the Architect.

B. Surface Preparation

1. General
   a. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers’ recommendations as approved by the Architect.
   b. Remove removable items which are in place and are not scheduled to receive paint finish; or provide surface applied protection prior to surface preparation and painting operations.
   c. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.

2. At existing surfaces, remove unwanted items, patch all holes, sand irregularities, and clean and prime patches prior to painting.

3. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.

C. Preparation of Wood Surfaces

1. Clean wood surfaces until free from dirt, oil, and other foreign substance.

2. Smooth finished wood surfaces exposed to view, using the proper sandpaper. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface.
   a. Lightly sand existing wood to even out surfaces.

3. Unless specifically approved by the Architect, do not proceed with painting of wood surfaces until the moisture content of the wood is 12 percent or less as measured by a moisture meter approved by the Architect.

D. Preparation of Metal Surfaces

1. Thoroughly clean surfaces until free from dirt, oil and grease.

2. Allow to dry thoroughly before application of paint.

3. Aluminum Substrates: Remove surface oxidation.

3.2 PAINT APPLICATION

A. General

1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
2. Slightly vary the color of succeeding coats.
3. Sand and dust between coats to remove defects visible to the unaided eye from a distance of 5 feet.
4. On removable panels and hinged panels, paint the back sides to match the exposed sides.
5. When patch painting, paint to nearest breakpoint or entire plane if whole room; refer to Finish Schedule.

B. Drying: Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suite adverse weather conditions.

C. Brush Applications
   1. Brush out and work the brush coats onto the surface in an even film.
   2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness and other surface imperfections will not be acceptable.

D. Spray Application
   1. Confine spray application to metal framework and similar surfaces where hand brush work would be inferior.
   2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
   3. Do not double back with spray equipment to build up film thickness of 2 coats in 1 pass.

E. Miscellaneous Surfaces and Procedures
   1. Exposed Mechanical Items
      a. Provide powder coat finish at electric panels.
      b. Finish access doors, conduits, pipes, ducts, grilles, registers, vents and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.
      c. Paint visible duct surfaces behind vents, registers, and grilles flat black.
      d. Wash metal with solvent, prime and apply 2 coats of alkyd enamel.
   2. Exposed Pipe and Duct Insulation
      a. Apply 1 coat of latex paint on insulation which has been sized or primed under other Sections; apply 2 coats on such surfaces when unprepared.
      b. Match color of adjacent surfaces.
      c. Remove band before painting, and replace after painting.
   3. Hardware
      a. Paint prime coated hardware to match adjacent surfaces;
      b. Paint metal portions of head seals, jamb seals, and astragal seals to match the color of the door frame unless otherwise directed by the Architect.
   4. Wet Areas
      a. For oil base paints, use 1 percent phenicimercuric or 4 percent tetrachlorophenol.
      b. For water emulsion and glue size surfaces, use 4 percent sodium tetrachlorophenate.
   5. Interior: Use “stipple” finish where enamel is specified.

3.3 INTERIOR PAINT SCHEDULE

A. Gypsum Board
   1. Eggshell Finish (Used Everywhere, Unless Otherwise Noted): Minimum 2 finish coats to cover over a primer.
      a. Primer: Latex based, interior primer applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
      b. Finish Coats: Low luster eggshell, acrylic-latex based, interior enamel applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
2. **Semigloss Finish (Where Noted):** Minimum 2 finish coats to cover over a primer.
   a. **Primer:** Latex based, interior primer applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
   b. **Finish Coats:** Semigloss, acrylic latex, interior enamel applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.

B. **Wood Intended for Opaque Finish**
   1. **Semigloss Finish:** Finish coat(s) to cover over a primer.
      a. **Primer:** Latex based, interior primer applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
      b. **Finish Coat:** Semigloss, acrylic latex, interior enamel applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.

C. **Wood Intended for Transparent Finish and For Existing Wood Touchup and Repair**
   1. **Waterborne, Satin-Varnish Finish:** 2 finish coats of a waterborne, clear-satin varnish over a filler coat and a waterborne, interior wood stain. Wipe wood filler before applying stain.
      a. **Filler Coat:** Paste-wood filler applied at spreading rate recommended by the manufacturer.
      b. **Stain Coat:** Waterborne, interior wipe-on wood stain applied at spreading rate recommended by the manufacturer.
      c. **First and Second Finish Coats:** Waterborne, wipe-on polyurethane finish applied at spreading rate recommended by the manufacturer.

D. **Ferrous and Galvanized Metal**
   1. **Semigloss, Acrylic Enamel Finish:** 1 finish coat over enamel undercoat and a primer. Primer is not required on shop-primed items.
      a. **Primer:** Quick drying, rust-inhibitive epoxy metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
      b. **Undercoat:** Acrylic, interior enamel undercoat or semigloss, acrylic latex, interior enamel, as recommended by the manufacturer for this substrate, applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.
      c. **Finish Coat:** Semigloss, acrylic latex, interior enamel applied at spreading rate required to achieve a total dry film thickness as recommended by the manufacturer.

E. **Non-Bridging Paint at Acoustical Ceiling Panels:** Apply in accordance with manufacturer’s recommendations, as manufactured by ProCoat Products, Inc., “ProCoustic”, or equal.

END OF SECTION
SECTION 10 14 00
SIGNAGE

PART 1 – GENERAL

1.1 SUMMARY
A. Section Includes: Code-related and wayfinding signage.
B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 REFERENCES
A. A. ADA - Americans with Disabilities Act
B. B. ASTM - American Society for Testing and Materials
C. CBC - California Building Code, 2016 Edition

1.3 SYSTEM DESCRIPTION
A. Design Requirements
   1. Match Owner's existing signage system in color, font, size, and sign shape.
   2. Modify existing signage where required to meet current ADA and CBC requirements.

1.4 QUALITY ASSURANCE
A. Regulatory Requirements
   1. Comply with ADA and CBC requirements for signage, to include Braille.
   2. Provide signs at public toilet rooms with the following text: MEN, WOMEN.

1.5 SUBMITTALS
A. Product Data: Submit manufacturer’s product data describing materials and signs.
B. Shop Drawings
   1. Provide shop drawings for each sign and location showing construction details for approval before proceeding with fabrication. Include full size details of exposed edges, joints between materials, hanging, hinging and locking systems and any other details which would affect sign appearance.
   2. Fasteners: Detail methods of fastenings and provide exact specifications for all fasteners noted on shop drawings.
   3. Artwork
      a. Submit full size patterns or prints of typical copy layouts and/or graphic elements to be applied on signs. Using layouts on the Drawings as a guide, optically enlarge and hand correct images before submitting to the Architect for approval before fabrication.
b. Elevator Lobby fire evacuation map art shall be schematically presented. Submit camera ready artwork for all floors to the Architect for approval prior to fabrication.

4. Sign Location: Provide Graphic Schedule and location plans to identify and locate all signs. Item numbers listed in the Graphic Schedule shall be found on location plans and shall identify locations of specific sign items.

C. Samples
1. On 6-inch by 6-inch pieces of actual sign materials, submit to the Architect for review and approval, 3 samples of painted and graphic finishes, in each material, color and finish, with texture to simulate actual conditions.
2. Provide listing of the material and application for each coat of each finish sample.
3. Be prepared to resubmit each sample as requested until required sheen, color and texture are approved.
4. Acrylic: Submit color and finish samples of plastics for approval before proceeding with fabrication. No substitution in color, thickness, finish or plastics will be accepted without written approval of the Architect.
5. Fasteners: Submit 1 sample of all fasteners and hardware for approval.
6. Paint: Submit 3 color and finish samples of all paints and finishes for approval prior to fabrication.

D. Operation and Maintenance: Provide the Owner’s Project Manager with proper cleaning instructions required for continued maintenance of signs.

1.6 QUALITY ASSURANCE

A. Pre-Installation Conferences: Sign locations shown on the location plans are for general information only. Prior to installation and as required, arrange meetings with the Architect at the site for final location for all sign items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: ASI Sign Systems, Inc.; Superior Sign Systems; Vomar Products, Inc., or equal.

2.2 MATERIALS

A. Plastic Signs: Matte finish acrylic plastic, minimum 1/8-inch thick, without frame, with corners radiused. Message and background color shall be sub-surface printed. Provide with raised room numbers and Braille.

B. Mounting Tape: Double-sided vinyl foam tape; provide silicone adhesive for attachment to wall surface.

C. Fasteners: Where fasteners are indicated or required, use exposed “torx type” tamper-proof security screws.

D. Coatings for Acrylic Plastic Sheet: Use colored coatings, including inks and paints for copy and background colors, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are non-fading for the application intended.
2.3 ACRYLIC SIGNS

A. Acrylic Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.

B. Unframed Acrylic Signs: Fabricate signs with edges mechanically and smoothly finished to conform with the following requirements:
   1. Edge Condition: Square cut.
   2. Corner Condition: 1/2-inch radius.
   3. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16-inch measured diagonally.

C. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.

D. Message Inserts: Where sign type makes provision for changeable name slots, provide laser printed name strips with text as scheduled. Obtain message from the Owner's Project Manager before fabrication. Where no text is scheduled, insert blank message strip in slot for future text by the Owner's Project Manager.

E. Photopolymer (Raised Copy): Machine-cut copy characters from matte finish opaque acrylic sheet and chemically weld onto the acrylic sheet forming sign panel face. Produce precisely formed characters with square cut edges free from burrs and cut marks.
   1. Panel Material: Matte-finished acrylic stock with opaque color coating surface applied; 2 colors, minimum 70 percent contrast between color 1 and color 2.
   2. Raised Copy Thickness: Not less than 1/32-inch.

F. Braille Symbols: California Contracted Grade 2 Braille shall be used wherever Braille symbols are specifically required in other portions of these standards. Dots shall be 1/10-inch on centers in each cell with 2/10-inch space between cells. Dots shall be raised a minimum of 1/40-inch above the background.

2.4 FINISHES

A. Colors: For exposed sign material that requires applied colors and other characteristics related to appearance, see Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the substrate and conditions in which the work is to be installed. Correct all unsatisfactory substrate and conditions prior to start of installation.

3.2 INSTALLATION

A. General
   1. Install signage in neat and proper manner.
   2. Install sign items, including all components, in accordance with reviewed Graphic Schedule at locations shown.
   3. Install signs properly aligned, level and true to line and dimension.
B. Install with reviewed manufacturer’s adhesive or mechanical fasteners after application of finish painting at heights noted.

3.3 SCHEDULE

A. Signage font, size, color and background color as indicated on the Drawings.

B. Signage shall be in compliance with CBC.

END OF SECTION
SECTION 21 10 00
WATER-BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.01 WORK INCLUDED
A. The work includes, but is not necessarily limited to, the modification of an existing wet pipe Sprinkler system, as shown and noted on the Drawings and specified herein. At completion of work, all systems shall be operational, tested and functioning in conformity with applicable codes and authorities having jurisdiction. In general, work shall include but not be limited to:
1. Modification of piping as shown on contract documents.
2. Remove existing sprinkler heads identified on plan and reinstall new heads at the completion of the structural work.
3. Submit with sprinkler shop drawings; support details and structural calculation of seismic bracing and pipe restraint system for the sprinkler piping per NFPA 13 by a California C16 Contractor.
4. Piping support and seismic bracing per NFPA 13 and 14.
6. Coordinate routing of sprinkler piping with the other trades for the project.
7. Identification of valves and labeling of piping.
8. Flushing and testing in accordance with NFPA 13 and 14.
9. Repair of all damages done to premise as a result of this installation and removal of all debris left by those engaged in this installation.
10. Repair leaks in piping and/or replace associated devices that are damaged during pressure testing work.

1.02 RELATED WORK SPECIFIED ELSEWHERE
A. Division 01 – General Requirements
B. Division 07 – Through Penetration Firestop Systems
C. Division 09 – Painting
D. Section 230500 – Common work results for Mechanical

1.03 CODES AND STANDARDS
A. This installation shall conform to the latest edition (including all appendices) at the time of bid or each of the following:
8. ANSI – American National Standards Institute.
10. ASME – American Society of Mechanical Engineers.

1.04 GENERAL REQUIREMENTS

A. Fire Protection general piping installation requirements shall follow 230500 Common Work Results for Mechanical, and as follows.

B. Fire protection mains and risers are shown diagrammatically on the drawings. Route all piping in strict coordination within ceiling and wall spaces, and with architectural features of the building. All applicable and pertinent details shall be strictly followed and complied with.

C. Sprinklers shall be pendent position at suspended ceilings, semi-recessed in T-bar ceilings, office and conference room and concealed at Gypsum Board and special ceilings, and in upright positions above ceilings, mechanical rooms, etc.

D. Where sprinklers are located at suspended ceilings, spacing shall be as required by NFPA 13, and as follows: Sprinklers shall be symmetrically placed, centered in ceiling tiles, and equidistant between lights, diffusers, and other elements. Sprinklers shall be spaced closer than the maximum spacing allowed so that symmetry and even spacing are achieved. Sprinklers locations where shown on reflected ceiling plans are for architectural aesthetic purposes. Submit exact locations on shop drawings. Type, size, arrangement, and configuration shall be subject to review and acceptance by the Fire Marshal.

E. Provide sprinklers in all combustible concealed spaces, and in concealed spaces with combustible materials.

F. Provide temporary fire service in accordance with California Building Code, Section 904.6.

G. All work in this Section shall comply with NFPA 13, NFPA 14, California Building and California Fire codes requirements, and local ordinances.

H. Secure and pay all fees for permits and inspections for this Section’s work.

I. Submit for review and approval, shop drawings, (copies as required by Division One), showing the complete piping and sprinklers layout for all areas of the building. Provide full sprinkler coverage per NFPA 13 and Title 24 requirements. Include complete computer hydraulic calculations for sprinklered areas and for hose valve standpipe system. These drawings shall indicate accurate locations of floor control valve assembly, piping, sprinklers, drain locations, inspectors test connections, bracing, end of line restraints and other apparatus associated with these systems in respect to architectural conditions, structural conditions, lighting layouts (surface mounted or recessed), diffuser layouts, ducts, laboratory section, plumbing, mechanical, and electrical layouts.

J. It is extremely important, that piping and sprinklers be designed and arranged, and coordinated with the work of the other trades, as space is very limited. Shop drawings and hydraulic calculations shall be submitted to the Engineer of Record prior to the submission to the County Fire Marshal. It shall be the Contractor’s responsibility to coordinate any changes with the Owner’s Representative regarding County Fire Marshal's submittal and County Fire Marshal's review comments.

K. Fire protection systems, shop drawings and calculations shall be prepared, stamped and signed by a State of California registered Fire Protection Engineer or Fire Protection design-build Contractor before submission for approval. No materials ordering, fabrication or installation shall begin prior to obtaining said approvals.

L. Drawings shall be to the same scale; same sheet size, and shall bear a title block, all in accordance with the Contract Drawings. Architectural backgrounds shall be in accordance with the latest Architectural Drawings. If, upon preliminary submittals of drawings, there are corrections to be made, such as sprinkler locations, pipe locations, drain locations, etc. corrections shall be made and the corrected drawings, along with revised calculations, shall be resubmitted for approval without extra cost. The drawings shall be corrected, and approval of
calculations and drawings, as specified hereinbefore, shall be obtained before starting work. The decision of the Owner's Representative shall be final on all items. These drawings and calculations, upon final approval, and including all record drawings and calculation changes at completion of the job, shall become a part of the Contract Documents. Significant changes and/or revisions during installation shall result in submission of As-Built drawings to SFM for review, prior to final field inspection of system by the County Fire Marshal.

M. Submit with sprinkler shop drawings: support details and structural calculation of seismic bracing and pipe restraint system for sprinkler piping and equipment, stamped and signed by a structural engineer registered in the State of California.

N. Furnish and install all carpentry, metal fabrication, size and location of concrete work required for equipment bases, piping, equipment supports and provide all rigging, hoisting, transportation, and associated work necessary for placement of all equipment in the final location shown.

1.05 QUALITY ASSURANCE

A. In accordance with Section 230500.3.6, "Common Work Results for Mechanical".

B. Contractors Qualifications: The work shall be designed and performed by a California licensed contractor with a valid State of California C-16 license in the installation, testing and maintenance of automatic fire sprinkler system and the same company shall have been in the business of installing fire sprinkler system for a minimum of 5 years. Fire protection systems, shop drawings and calculations shall be prepared, stamped and signed by a State of California registered Fire Protection Engineer.

C. Welding Materials and Procedures: Conform to and comply with ASME BPVC Section IX, 29 CFR 1910.1027, and applicable State labor regulations.

D. Provide Welder Certificate in accordance with AWS D1.1 for all personal that will be performing welding work for this installation.

1.06 SUBMITTALS

A. Submit product data, shop drawings, and samples in accordance with Division 1 and Section 230500, "Common Work Results for Mechanical", and as follows:

B. Shop Drawings and Working Plans.
   1. Shop drawings, and working plans in accordance with the requirements found in NFPA 13 and NFPA 14 shall be submitted to the Owner's Representative for review before submitting to the County Fire Marshal.
   2. After review by the Owner's Representative the contractor shall revise the working drawings and calculations if appropriate, prior to submitting the working drawings to the Fire Marshal's Office for review.
   3. The contractor shall revise the working drawings and calculations if appropriate, addressing each comment of the fire marshal prior to resubmitting the working drawings to the Fire Marshal's Office for approval and permit.
   4. The Fire Sprinkler Designer is responsible for obtaining water supply test data from the Owner's Fire Department for use in system design. Preferred hydrant locations are with the non-flowing hydrant upstream of the building lateral and the flowing hydrant downstream. Flows should be at least what are required for design. This may require one or both hydrant outlets and more than one hydrant be opened. Preferred test time is during high water use periods. If flow and pressure are not adequate, provide electric motor driven fire pump and jockey pump for proper fire protection water supplies.
   5. Seismic Restraints:
   6. The NFPA-13, 6-4.5.6 Seismic sway bracing calculations horizontal force factor shall comply with the higher factor as indicated in Section 230529, 2.3, B;
7. Importance Factor for Seismic Loading ($I_P$) = 1.5 for Life Safety Systems

C. Product Data:
1. Piping and fittings.
2. Valves.
3. Sprinklers and accessories.

D. Drawings of Record:
1. See Division One for General record drawing requirements.
2. Updating Drawings: Provide and keep a complete record set of up-to-date, approved shop drawings, corrected daily to show every change from the approved shop drawings. Keep this set of prints on the job site and use only as a record set.
3. Final Record Set: Upon completion of the work, the record drawings shall be submitted for review by the Owner’s Representative, and/or Fire Marshal. After review, the record set shall be used to produce a set of vellum drawings of the completed installations. The record set and the original vellums shall be turned over to the Owner.

1.07 MANUFACTURER’S CERTIFICATES OF COMPLIANCE
A. When requested by the Owner’s Representative, and / or Authority having jurisdiction, Contractor shall submit manufacturers’ Certificates of Compliance for any materials furnished.

1.08 SITE INSPECTION
A. Before submitting proposals for this work, each bidder will be responsible to have examined the premises and understands the conditions under which he/she will be obligated to operate in performing his/her part of the Contract.
B. Grooved coupling manufacturer’s factory representative shall provide on-site training for Contractor in proper use of grooving tools, application, and installation of grooved piping products. Factory trained representative shall periodically inspect and make recommendations and comments on the installation.

1.09 LOCATIONS AND ACCESSIBILITY
A. The sprinkler contractor shall fully inform himself/herself regarding any and all peculiarities and limitations of the spaces available for this installation. Head locations in exposed areas shall be coordinated with the Architect during design to show desired portion for aesthetic reasons and convenience for installation access.
B. Route fire protection piping in designated ceiling spaces, wall spaces, and coordinated with Architectural features of the building. Unless otherwise noted, there shall be no exposed fire protection piping.

1.10 COOPERATION
A. The sprinkler contractor’s work shall be coordinated with the work of the other trades toward the general purpose of having the construction progress as rapidly and as smoothly as possible with a minimum of interference between one trade and another.
B. The sprinkler contractor shall coordinate with Construction Manager, Owner’s Representative, in writing a minimum of 3 days in advance for shut-downs of existing fire sprinkler system to make final connections. Notify the local fire department for temporary fire service.

1.11 DELIVERY, STORAGE, AND HANDLING
A. Comply with pertinent provisions of the architect’s documents.
B. Use all means necessary to protect fire protection materials before, during, and after installation and to protect the installed Work and materials of all other trades.
C. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner’s Representative and at no additional cost to the Owner.

D. Equipment Furnished by the Contractor: Specific provisions for delivery and storage locations, as well as handling, protection, and security measures shall be included in the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General:

1. All material and equipment shall be the latest design of the manufacturer and shall be listed by:
   a. California State Fire Marshal,
   b. Underwriters Laboratories (UL) latest list of Inspected Fire Protection Equipment and Materials
   c. Factory Mutual Laboratories latest list of Approved Equipment, Fire Protection Devices, and Devices Involving Fire Hazard

2. Materials and equipment furnished by the Contractor shall be new, first grade products of current manufacturer. All materials and equipment shall be approved and/or listed for use in automatic sprinkler systems for the intended use. Where two or more pieces of equipment performing the same function are required, they shall be the product of one manufacturer.

B. Piping, Fittings and Specialties:

1. Black steel pipe welded and seamless, Type F, Grade A, ASTM A53; black welded and seamless steel pipe for fire protection use, Type F, ASTM A795; electric resistance welded steel pipe, Grade A, ASTM A135.

2. Interior piping 2”and smaller: ASTM A53, A135, Schedule 40 steel piping with threaded fittings. As an option, Allied Dyna-thread schedule 30 pipes can be used.

3. Interior piping 2-1/2”and larger: ASTM A53, A135, Schedule 10 black steel piping with roll grooved ends and ductile iron groove couplings and fittings, in accordance with NFPA 13 (2013), Tables 6.3.1.1 and 6.4.1.

4. Fittings used in sprinkler systems shall be ASME B16.4 cast iron, ASME B16.3 malleable iron, and steel fitting conforming to ASME B16.9 listed in NFPA 13 Table 3-5.1, or in accordance with NFPA 13 Section 3-6.2. When water pressures exceed 175 PSI, extra-heavy pattern fittings shall be used.

5. Welded tee fitting: Merit, or equal. Shop-welded thread-o-lets may be used in lieu of tee fittings, but field (site) welding will not be permitted.

6. Pipe joints shall be threaded; flanged or grooved utilizing standard or light-weight grooved flexible and rigid-type ductile iron couplings installed in accordance with their individual listings. Groove in Schedule 40 steel piping shall be cut grooved.

7. Threaded joints shall be made up with approved Teflon tape or pipe thread compound. Flanged joints shall be made up with suitable gaskets and machine bolts with nuts having dimensions and conforming to American Standard B18.2-1955. All pipe thread tapes or compounds, and all gasket materials shall be 100% free from ACM's (asbestos containing materials).

8. Pipe Thread Sealant: Brush-on pipe thread sealant with Teflon or Grinnell Tuff-Loc.

9. Flexible and rigid-type grooved couplings: shall be UL listed, FM Global approved, and manufacturer approved for use in sprinkler and standpipe installations. Reducing type couplings are not acceptable; use concentric reducing fitting. Strap-on type saddle tees, strapless tees and C hooker type tees are not acceptable; use mechanical tees.
10. Flexible couplings shall be installed in accordance with NFPA 13. Victaulic, Anvil (Grinnell), or equal.
   a. Rigid Type: Coupling housing cast with offsetting, angle pattern bolt pads.
   b. Flexible Type: Use in accordance with NFPA 13, and where vibration attenuation and stress relief are required.

C. Unions:
   1. Steel piping 1-1/2" and smaller: Malleable iron, ground joint, 150 PSIG.
   2. Steel piping 2" and larger: Raised face flanges 150 PSIG.

D. Valves:
   1. Ball Valves: Nibco, Jenkins, Crane, or equal, bronze body with chrome plated ball, and lever handle, 175 PSI rated.
   2. Butterfly Valves: Victaulic Series 705W, Nibco GD-4765-8N, or equal, UL listed and FM Global approved, ductile iron body with grooved ends, encapsulated ductile iron disc with integral cast stem, 416 stainless steel bearings, gear operated slow closing with flag indicator, and two internal SPDT supervisory switches, 300 PSI rated.
   3. Check Valves: Nibco KT-403-W, Jenkins, Crane, or equal, UL listed and FM Global approved, swing bronze disc with Buna-N seat for sizes up to 2", and Nibco F-908-W iron body with bronze trim for sizes 2-1/2" and larger, 175 PSI rated.
   4. Check Valves: Nibco G-917-W, Victaulic Series 717, or equal, grooved end, iron body, bronze seat, stainless steel clapper with a replaceable Grade E EPDM rubber clapper facing (a rubber seal integral with the seat is not acceptable), and 250 PSI rated. Check valves for underground installation shall be flanged.

E. Sprinklers:
   1. Sprinkler heads shall be upright, pendant, recessed pendant, concealed pendant or sidewall as appropriate for the ceiling location. Shall be, UL listed, and/or FM Global approved. Victaulic Series V27, Central TY-B series, Reliable model F1 series, Star, Viking, or equal.
   2. Where maximum ceiling temperatures exceed those outlined in Tables 8.3.2.5(a) and 8.3.2.5(b) of NFPA 13, sprinklers of temperature ratings appropriate for the particular conditions shall be used.
   3. Sprinkler body shall be die cast brass, with hex-shaped wrench boss cast into the body to facilitate and reduce the risk of damage during installation.
   4. Sprinkler escutcheons shall be white in color (or other color at Architect's option), and they shall be listed and approved for use with sprinkler heads.
   5. Where horizontal ceiling obstructions to spray patterns occur, pendant sprinklers shall utilize two-piece escutcheons. Escutcheons having an overall depth of 1-1/2 inch shall not be used except where it is necessary to install a sprinkler farther below the ceiling than is customary due to deep horizontal obstructions.
   6. Fully recessed concealed, quick response pendant sprinkler, Victaulic Series V38, Central RF II, Reliable model G4, or equal, UL listed, and/or FM Global approved, head with white painted cover.
   7. Semi-recessed quick response pendant, and sidewall sprinkler heads, white finish with white escutcheons, Victaulic, Central, Reliable, or equal.
   8. All sprinklers shall be in accordance with NFPA 13 Section 8.3.1. Sprinklers shall have 1/2 inch orifice.
   9. All pendant sprinklers supplied by concealed piping shall be factory chrome plate finish, unless otherwise noted.
   10. Sprinkler guard for all sprinkler heads located within seven feet (7') of the floor. Victaulic, Central, Viking, Reliable, or equal, steel wire welded to steel plates.
F. Signs:
1. Provide at all control, drain and test valves with signs identifying the type of valve and the area (floor or portion of the building) affected by the valve. Signs shall be three layer etched plastic with red letters on white background. Letters are to be minimum 1 inch high. Submit the working for approval, for example “CONTROL VALVE SECOND FLOOR.” The signs are to be hung by a chain from the valve. For all hydraulically calculated systems, provide hydraulic nameplate in accordance with NFPA 13.
2. Provide a copy of all hydraulic nameplates for facility operation in a bound binder after training.

G. Hanger and Supports:
1. Support from steel beam above: Anvil (Grinnell), Tolco, or equal, UL and/or FM Global approved, C type beam clamp with retaining strap for beam flange mounting.
2. Support from concrete deck above: Hilti model Kwik-Bolt 3, ITW model Redhead, or equal, wedge type expansion concrete anchors.
3. Piping supported tight to wall, floor, or ceiling: 1-5/8 inch square 12 gauge galvanized channel complete with pipe clamp, all nuts and bolts, and end caps. Bolt channel to wall, floor, or ceiling. Depth of embedment for anchor bolts shall comply with CBC, and NFPA 13 and 14.
4. Hangers: Anvil (Grinnell), Tolco, or equal, UL and/or FM Global approved, ring hanger, or J-hanger, galvanized finish.
5. Rods shall be sized in accordance with manufacturer's requirements, and NFPA 13 and 14.
6. Seismic bracing: Anvil (Grinnell), Tolco, or equal, UL and/or FM Global approved, brackets, all in accordance with NFPA #13, and California Building Code requirements. Seismic bracing members shall be mounted to building structure only.
7. Supports between structural members: Galvanized channel spanning two adjacent beams, trusses, and ring clamp.
8. Support at end of branch piping: Extend full size last section to beam, or truss and support with hanger. Last hanger of branch shall be provided with end of the line restraint hanger assembly.

H. Miscellaneous steel, bolts, nuts, and washers:
1. Miscellaneous steel angles, channels, brackets, rods, clamps, etc, shall be of materials conforming to ASTM A36. All steel parts exposed to weather or where noted shall be hot dipped galvanized after fabrication. All bolts and nuts, except as otherwise specified, shall conform to ASTM. Bolts shall have heavy hexagon heads, and nuts shall be of the hexagon heavy series. All bolts, washers, nuts, anchor bolts, screws, and other hardware, unless otherwise specified, shall be galvanized, and all galvanized nuts shall have a free running fit.

I. Escutcheons:
J. Chromium-plated, split ring type, brass floor and ceiling plates with brass set screw.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Contractor's Shop Drawings:
1. Before installation begins, drawings and calculations for the installation of sprinklers shall be reviewed and accepted by the authorities having jurisdiction, the local Fire Marshal. The Contractor shall complete the installation in accordance with the project requirements and the requirements of NFPA 13 and 14.
2. Contractor shall determine actual project dimensions in the field and make such length and offset adjustments as may be necessary to complete the installation at no extra charge to the Owner. Any changes in the design of the system shall be noted as such on the Drawings of Record required by Section 1.5.B.

3. Sprinklers: Locate sprinkler in locations as indicated on reflected ceiling plan maintaining minimum clearances from obstructions, ceilings and walls. Install sprinklers level in locations not subject to spray pattern interference. Provide fire sprinklers below wide ductwork, soffits, etc.

B. General:

1. All fire detection and electrical equipment shall be installed in accordance with the requirements of NFPA 72, and Division 26, Fire Alarm and Detection Systems.

2. Fire Water supplies for the sprinkler systems shall be taken from the distribution system as indicated on Contract Drawings. Provide backflow prevention device as required by authority having jurisdiction prior to entering the building.

3. The Contractor shall be responsible for any and all openings required for sprinkler piping installation.

4. Cutting of structural members for passing sprinkler piping or pipe hanger fastenings will not be permitted except with approval of the Architect.

5. Sprinkler supply drops down from overhead branch or main shall be made with rigid steel piping and malleable iron threaded fitting in accordance with NFPA 13 requirements. Sprinklers shall be attached to rigid piping drops, except use flexible connection assembly for connecting sprinkler heads in fume hoods and fume hood exhaust ductwork. Adjustable nipples are not permitted in Vivarium rooms and adjoining areas.

6. Where piping passes through walls, there shall be a minimum annular space around the pipe, in accordance with NFPA 13 requirements. Annular space between the piping and the adjacent construction shall be sealed watertight using an approved/listed system. Apply sealant in accordance with manufacturer’s instructions and the product listing.

7. All piping shall be reamed to full bore of piping to remove all burrs, and pipe sections shall be cleaned inside to remove all chips and foreign materials prior to making joints.

8. All grooved couplings, fittings, valves, and specialties shall be of one manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. Gaskets shall be molded and produced by the grooved coupling manufacturer. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove.

9. Hangers, flexible connections and seismic bracing shall be installed in accordance with the requirements of NFPA 13, including the appendices.

10. Split wall plates or escutcheons shall be installed where exposed piping passes through a finished floor, wall or ceiling. They shall fit snugly around piping, and shall cover the entire annular space around the piping. The finish of escutcheons or wall plates shall match the color of adjacent walls, ceiling or floors. At all fire rated floors, walls or ceilings, suitable means shall be provided at each penetration to insure effectiveness of floor or wall as a fire stop.

11. Inspector’s test valves shall be installed downstream of each water-flow device. Inspector’s test outlets shall be piped to drain into the sanitary sewer system. Valves shall be within six feet (6’) above the floor, or finished grade. When the discharge outlet cannot be seen from the valve or when inspector’s test connections are piped into the sewer system, a sight glass shall be provided. Direct connections shall not be made between sewers and sprinkler drains per NFPA 13 section 8.15.2.6.

13. Sprinkler locations near surface mounted light fixtures shall be pendent type and meet the "beam rule". Provide canopies for exposed piping and sprinkler head installation.


15. Provide sprinkler heads inside fume hoods and exhaust ductwork per San Clara County Fire Marshal requirements.

3.02 PAINTING AND MARKING OF PIPING

A. General:
   1. Paint all exposed steel piping, equipment and other materials such as fittings, hangers, etc., except sprinkler heads, bronze or brass fittings and/or moving parts shall be under Painting section of Work.
   2. Sprinkler protective bags or wrappings shall be removed after painting is finished. All sprinklers which have any paint on them shall be replaced. Cleaning of painted sprinklers will not be allowed.
   3. Provide pipe markers with the words "AUTO SPRINKLER" or "FIRE SPRINKLER" in minimum 2 inch high lettering to identify all system piping. Markers shall be so located so as to be easily read from the ground or floor level. Markers shall be spaced at a maximum of 25 feet between markers. Attach pipe markers after painting work and before installing finish ceilings.

3.03 CLEANING AND ADJUSTING

A. Prior to pressure testing, flush all sprinkler piping with water until clear, and in accordance with NFPA 13.
   B. Adjust all pressure gauges to read "0" prior to water pressurization.
   C. Clean all valves, gauges, and equipment of dust, markings, and debris after completion of Work.
   D. Remove all masking from sprinkler heads at completion of Work.

3.04 TEST

A. Sprinkler piping shall be tested before covering or concealing, in accordance with NFPA 13 and 14.
   B. Provide minimum 72-hour notification prior to any test to the Fire Marshal and the Owner’s Representative. Schedule tests at times acceptable to above agencies and representatives.
   C. Test piping with 200 PSI hydrostatic pressure for no less than 2 hours. Testing shall be witnessed by the local Fire Marshal.
   D. Should pressure test fail due to leakage, remove, repair or replace defective part of the sprinkler system with new. Re-test entire system, in accordance with above paragraph.
   E. Upon completion of inspections and tests, a "Contractor's Material and Test Certificate" shall be completed and signed by the Contractor and any witnesses to the tests. Submit the original of the completed certificate to the Owner’s Representative prior to acceptance of the system.

3.05 INSPECTION

A. After completion of the fire protection installation and at the start of the guarantee period, execute the National Automatic Sprinkler and Fire Control Association, Inc., standard form of "Inspection Agreement," at no increase in Contract amount, calling for four inspections of the sprinkler system during the guarantee year. Fill out "Inspection Agreement" in triplicate after each inspection and send copies to the Owner’s Representative and Fire Marshal.
PART 1     GENERAL

1.01     WORK INCLUDED

A. The work includes, but is not necessarily limited to the modification and testing of all plumbing work, as shown and noted on the Drawings, Specifications and work required but not shown for complete operational systems. At completion of work, all systems shall be operational, and functioning in conformity with applicable codes and authorities having jurisdiction.

B. Domestic Cold Water System:
   1. The existing domestic cold water piping shall be modified to allow the structural upgrades to take place.
   2. Provide temporary pipe hangers where the existing ceiling is removed for structural upgrades.
   3. Provide final permanent pipe hangers when structural upgrades are competed.
   4. Refer to Section 221000 – Plumbing, Piping, and Valves for materials.

C. Storm Water Drainage:
   1. The existing Storm Water piping shall be modified to allow the structural upgrades to take place.
   2. Provide temporary pipe hangers where the existing ceiling is removed for structural upgrades.
   3. Provide final permanent pipe hangers when structural upgrades are competed.
   4. Refer to Section 221000 – Plumbing, Piping, and Valves for materials.

D. Natural Gas System:
   1. The existing Storm Water piping shall be modified to allow the structural upgrades to take place.
   2. Provide temporary pipe hangers where the existing ceiling is removed for structural upgrades.
   3. Provide final permanent pipe hangers when structural upgrades are competed.
   4. Refer to Section 221000 – Plumbing, Piping, and Valves for materials.

1.02     RELATED WORK SPECIFIED ELSEWHERE

A. Section 220523 – General Duty Valves
B. Section 220700 – Plumbing Insulation
C. Section 221000 – Plumbing Piping

1.03     CODES AND STANDARDS

C. NSF – National Sanitation Foundation
D. SDWA – Federal Safe Drinking Water Act
E. UL – Underwriters Laboratories
F. FM – Factory Mutual
G. AWWA – American Water Works Association
H. ANSI – American National Standards Institute
1.04 QUALITY ASSURANCE

A. Designer Qualifications: All plumbing design work shall be signed and stamped by a professional mechanical or civil engineer (as applicable) licensed in the state of California. Requests for exceptions to this requirement shall be evaluated by the Owner's Representative.

B. Testing:
1. Plumbing installers shall provide testing services as set forth in the Contract Documents.
2. All testing shall be performed in the presence of the Project Manager's representative.
3. Deviations from the cleaning, testing, and certification requirements set forth in the Contract Documents shall be requested in writing, stating reasons; and are subject to approval by the Project Manager's Representative.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Pre-purchased Equipment: The consultant responsible for the pre-purchase specification of equipment or materials shall consult the Project Manager regarding delivery, inspection and acceptance, storage, and handling of the products.

1.06 GENERAL DESIGN CONSIDERATIONS

A. General:
1. Design shall be in accordance with applicable ASHRAE and ASPE handbooks.
2. Maintenance shall be an important design consideration for all systems. Sectional valving shall be included, so that shutdown of parts of systems need not disrupt operation of entire building systems.
3. Water and energy conservation shall be important design considerations for all systems.
4. Design parameters for equipment selection shall conform with ASHRAE, ASPE, and UPC.
5. Water distribution velocities shall be selected for minimal noise levels while maintaining adequate flow.
6. Careful attention shall be given to the prevention of water hammer in the design of water distribution systems.
7. Cleanout locations and access shall be selected for service accessibility, as well as to minimize disturbance of occupant functions and building systems operation during cleanout servicing.
8. Routing of plumbing piping shall be planned such that pipe leakage would result in minimal damage to books, manuscripts, sensitive instruments and equipment, etc.
9. Coordination: The Owner expects careful design coordination between plumbing, process piping, HVAC, electrical, and fire protection systems. Scaling of drawings shall be coordinated between major disciplines to facilitate plan checks by the overlay method.
10. Provide floor drain (with trap and primer) in mechanical rooms and other locations as required by Code.

B. Pressure Piping Interface: Pressure piping systems (domestic and fire service, chilled water, etc.) which typically use a restrained joint system (welded, threaded, victaulic,
etc.) for hung interior piping and an unrestrained joint system (rubber-ring, push-on, mechanical joint, etc.) for buried exterior piping must be anchored, or otherwise restrained inside the structure to prevent separation of the unrestrained joints under pressure. Required restraints must be designed to carry the substantial loads generated by a minimum hydrostatic pressure of 150 PSI, or higher if the completed system will be subjected to higher pressure such as in testing. Design calculations for the restraints should be included in the engineering submittals.

C. Sanitary Waste: Sanitary waste systems shall be designed to allow for future addition of laterals to accommodate twenty (20%) percent expansion of system capacity.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY
A. Section includes valves for building services piping.

1.02 REFERENCES
B. ASME B16.3 (American Society of Mechanical Engineers) - Malleable Iron Threaded Fittings.
C. AWS (American Welding Society) - Welding and Brazing Qualifications.
D. MSS SP-67 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Butterfly Valves.
E. MSS SP-71 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
F. MSS SP-80 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Bronze Gate, Globe, Angle and Check Valves.
H. MSS SP-110 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Ball Valves Threaded, Socket-Welding, Solder

1.03 SUBMITTALS
A. Section 01 33 00: Submittal Procedures.

1.04 CLOSEOUT SUBMITTALS
A. Section 01 77 00 – Closeout Procedures.
B. Project Record Documents: Record actual locations of valves.
C. Operation and Maintenance Data: Submit installation instructions, spare parts lists, exploded assembly views.

1.05 QUALITY ASSURANCE
A. Perform work in accordance with applicable codes and laws.
B. Maintain one copy of each document on site.

1.06 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.07 PRE-INSTALLATION MEETING
A. Convene minimum one week prior to commencing work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING
A. Store and protect equipment.
B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
C. Provide temporary protective coating on cast iron and steel valves.

1.09 ENVIRONMENTAL REQUIREMENTS
A. Store and protect equipment.
B. Do not install valves underground when bedding is wet or frozen.

1.10 WARRANTY
A. Section 01 77 00 – Closeout Procedures: Product warranties and product bonds.
B. Provide a minimum of one year manufacturer’s warranty for valves excluding packing.

1.11 EXTRA MATERIALS
A. Section 01 77 00 – Closeout Procedures: Spare parts and maintenance products.
B. Supply two packing kits for each size valve.

PART 2 PRODUCTS

2.01 GATE VALVES
A. Up to and including 3 inches:
   1. MSS SP-80, Class 125, bronze body, bronze trim, rising stem, hand-wheel, inside screw, solid wedge disc, solder ends.
B. 4 inches and larger:
   1. MSS SP-70, Class 125, iron body, bronze trim, outside screw and yoke, hand-wheel, solid wedge disc, flanged ends. Provide chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.02 GLOBE VALVES
A. Up to and including 3 inches:
   1. MSS SP-80, Class 125, bronze body, bronze trim, hand-wheel, teflon disc, threaded ends.
B. 4 inches and larger:
   1. MSS SP-85, Class 125, iron body, bronze trim, hand-wheel, outside screw and yoke, renewable bronze plug-type disc, renewable seat, flanged ends. Provide chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.03 BALL VALVES
A. 4 inches and smaller, valves over 4 inches shall be gate valves:
   1. MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle, threaded ends.

2.04 BUTTERFLY VALVES
A. Construction 1-1/2 inches and larger:
   1. MSS SP-67, 200 psi CWP, cast or ductile iron body. Nickel-plated ductile iron disc, resilient replaceable EPDM seat, lug ends, extended neck, lever handle Provide gear operators for valves 8 inches and larger, and chainwheel operators for valves mounted over 8 feet above floor.
2.05 SWING CHECK VALVES
A. Up to and including 3 inches:
   1. MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, threaded ends.
B. 4 inches and larger:
   1. MSS SP-71, Class 125, iron body, bronze swing disc, flanged ends.

2.06 SPRING LOADED CHECK VALVES
A. Construction: Class 125, iron body, bronze trim, stainless steel springs, bronze disc, Buna N seals, wafer style ends.

2.07 WATER PRESSURE REDUCING VALVES
A. Low Pressure Up to 2 inches:
B. Regular Pressure Up to 2 inches:

2.08 RELIEF VALVES
A. Pressure Relief:
   2. Construction: Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated at maximum 60 psi, UL listed for fuel oil, capacities ASME certified and labeled.
B. Temperature and Pressure Relief:

2.09 NATURAL GAS VALVES
A. Nibco, Milwaukee, Red & White, Homestead, Nordstrom, DeZurik, or equal.
   1. T-FP-600, threaded ends, UL Listed, and CGA approved, 2-piece full port brass ball valve with threaded ends, 600 PSI. Use for sizes 1-1/2” and smaller.
   2. Homestead 602, Nordstrom 115, DeZurik 425, or equal, semi-steel, lubricated plug valve with threaded ends or flanged ends. Use for sizes 2” and larger.

2.10 INSTALLATION
A. Provide brass transition fittings at connections wherever joining dissimilar metals.
B. Install valves with stems upright or horizontal, not inverted.
C. Use grooved mechanical couplings and fasteners only in accessible locations
D. Install unions downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.
E. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
F. Install globe valves for throttling, bypass, or manual flow control services.
G. Provide spring loaded check valves on discharge of water pumps.
H. Provide plug valves in natural or propane gas systems for shut-off service.

General Duty Valves
22 05 23 -3
I. Provide flow controls in water re-circulating systems where indicated.

J. Use all bronze valves for fuel oil service.

K. Use 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

L. Provide ball valves at each room with plumbing fixtures at an accessible location for easy isolation from mains.

2.11 INTERFACE WITH OTHER PRODUCTS

A. Conform to applicable piping specification for hangers and insulation.

END OF SECTION
PART 1  GENERAL

1.01  SYSTEM DESCRIPTION
A. This section provides specifications for plumbing piping inside a building: Domestic water, sanitary waste, vent, and natural gas piping.

1.02  DELIVERY, STORAGE, AND HANDLING
A. Equipment Furnished by the Contractor: Specific provisions for delivery and storage locations, as well as handling, protection, and security measures shall be included in the Contract Documents.

1.03  SUBMITTALS - Reference Section 01 33 00
A. In addition to the requirements of Section 01 33 00 Submittal Procedures, a complete schedule of valves installed, together with drawings that identify the locations of numbered valves and the service which each controls, shall be submitted to the Project Manager.

PART 2  PRODUCTS

2.01  PIPING
A. Domestic Water:
   1. Above Grade: ASTM B88 (ASTM B88M), TYPE L drawn copper tube.
   2. Fittings: ASME B16.18 cast copper or ASME B16.22 wrought copper and bronze.
   3. Joints: ProPress fittings ProPress copper press fittings shall be installed using the proper tool, actuator, jaws and rings as instructed by the press fitting manufacturer. Copper and copper alloy press fittings shall conform to material requirements of ASME B16.51 and performance criteria of IAPMO PS 117. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer.

B. Drainage Piping
   1. Waste
      a. Above grade
         1) 1.5 inch and Smaller: Copper Type M or L DWV fittings, soldered, Galvanized steel or cast iron no-hub. Husky, Clamp-All, or equal, heavy duty stainless steel bands on all piping.
         2) 2 inch and Larger: Copper Type M or L DWV fittings, soldered, Cast-iron, no-hub
   2. Vents
      a. Above grade
         1) 1.5 inch and smaller: Galvanized steel or cast iron no-hub.
         2) 2 inch and larger: Cast-iron, no-hub, service weight with “Clamp-All” heavy duty stainless steel bands on all piping.
  3. Condensate drainage
a. Type DWV copper or type M copper.

C. Natural Gas Piping

1. Above Floor Piping: ASTM A-53, Schedule 40 black steel piping with malleable iron threaded fitting conforming to ANSI B16.3, and Schedule 40 steel fitting for butt welding conforming to ASTM A234, OR ASME B16.9-grade piping

PART 3 EXECUTION

3.01 PIPING INSTALLATION

A. General:

1. Where galvanically dissimilar pipe materials interconnect, appropriate manufactured adapters or flanged connections with suitable gaskets shall be provided.
2. Piping shall be protected from damage and contamination during transport and construction. Exposed ends of piping shall be kept sealed prior to and during erection and at the end of each working day.
3. Copper tubing and piping shall be cut with dedicated wheel cutter. Cut ends shall be square to form proper seating in socket fittings. All cut ends shall be reamed and deburred. All piping needs to be flushed in compliance with current plumbing code.
4. Wherever changes in sizes of piping occur, make such changes with reduced fittings, as the use of face bushings will not in general be permitted. Install eccentric reducing fittings where necessary to provide free drainage of lines.
5. Support all pipe from the building structure so that there is no deflection in pipe runs. Piping support spacing shall comply with CPC Tables 313.3 and 313.6, and as noted in table below. Fit piping with steel sway braces and anchors to prevent vibration and/or horizontal displacement under load when required. Do not support piping from, or brace to, ducts, other pipes, conduit, or any materials except building structure. Piping or equipment shall be immobile and shall not be supported or hung by wire, rope, plumber’s tape or blocking of any kind. Double wrap copper pipe with heavy vinyl tape where pipe comes in contact with ferrous material.

B. Check all piping runs before hand with all other trades. Run piping to maintain proper clearance for maintenance and to clear opening in exposed areas. Run piping in strict coordination with mechanical piping, ducts and equipment, structural and architectural conditions. Where work of other trades prevents installation of the piping as shown on the Drawings, reroute piping at no extra cost. Verify all inverts and pitched lines before starting work.

C. Water System Piping: Piping shall be arranged, pitched, and valved for complete drainage and control of each system. Isolation valves to be installed per floor, per room per fixture.

D. Vents and Drains:

1. Vents shall be pitched to drain, collected at risers where practical, offset toward the center of the building, and extended through the roof. All traps and sumps shall be vented.
2. Relief Valve Drain: Union shall be installed on drain line on discharge side of relief valve within 3 inches (3") of relief valve.
3. Liquid Waste: Waste pipe centerline shall be located within 1 (1") inch of its corresponding fixture centerline where the waste pipe passes through the wall.

E. Gas piping shall be sized and installed in accordance with California Plumbing Code and NFPA 54
F. Piping Supports:
1. Spring vibration isolation pipe hangers shall be installed in mechanical rooms and areas sensitive to vibration. The drawings shall indicate specific areas where this requirement applies.
2. Plastic piping shall be supported as specified in UPC.

3.02 BRAZING AND SOLDERING
A. Brazing and Soldering:
1. Brazing: Use fifteen (15) percent silver, 80 percent copper and five (5) percent phosphorus for the following:
   b. Copper pipe: three inches (3") and larger.
   c. Underground, or under floor piping.
   d. No solder fittings underground.
2. Soldering: Use 95-5, tin-antimony solder for other copper piping.
3. Preparation/Installation:
   a. Clean surfaces to be joined, of oil, grease, rust and oxides. Clean socket or fitting and end of pipe thoroughly with emery cloth to remove dust and oxides. After cleaning and before assembly or heating, apply Handy or Aircosil Flux to joint surface and spread evenly.
   b. Cut copper tubing with copper tub cutters, size with sizing tool, and thoroughly clean before application of flux and solder.
   c. All joints that show evidence of overheating, cracking, poor penetration, or other defects of fit-up or workmanship shall be replaced as directed by the Project Manager at Contractor's expense.

3.03 FIELD QUALITY CONTROL
A. General
1. Any deviation from the installation, cleaning, and certification requirements herein shall be approved in writing by the Project Manager.
2. All materials and workmanship shall be subject to inspection and examination by the Project Manager and/or Project Manager's representative at any place where fabrication or erection is carried on.
3. The Project Manager and/or the Project Manager's representative, reserves the right to reject all or any part of the system that does not conform to the requirements herein. Rejected materials or equipment shall be returned at the Contractor's expense for re-cleaning and certification.
4. The Project Manager and/or the Project Manager's representative reserves the right to remove random samples of the installed work sufficient to establish the quality of materials and workmanship. If such samples indicate materials and workmanship do not meet the contract specification, the Contractor shall be required to replace or re-clean the installed work at no expense to the University. The University shall reimburse the Contractor on a time and materials basis for such work if the system proves to be installed to specification.
5. Upon completion of this work, all systems shall be adjusted for use. Should any piece of apparatus or any material or work fail in any test, it shall be immediately removed and replaced by new materials. The defective portion of the work shall be replaced by the Contractor in the presence of the Project Manager and/or the Project Manager's representative at no expense to the University.
6. Any leaks found shall be repaired in the following manner:
a. Brazed joint - Cut out and re-braze
b. Screw joint - Taken apart and re-done (do not use compound)

3.04 CLEANING

A. General Cleaning Requirements: All pipe, fittings, valves, and system-related materials shall be cleaned before use. Contractor shall indicate in writing when each system is sufficiently clean for consideration by the Project Manager and/or the Project Manager's representative for acceptance. Tie-in to central systems shall not occur prior to receipt of written acceptance from the Project Manager and/or the Project Manager's representative.

B. Water Pipe Cleaning: All domestic cold and hot water piping shall be cleaned and disinfected as follows:

1. The Contractor shall employ an agency licensed to certify the disinfecting operation to provide the orthotolidine testing equipment and make tests, take water samples, procure bacteriological analysis, and issue written approval of satisfactory disinfection results for the Architect and Project Manager.
2. The Contractor shall furnish labor, equipment, materials, and transportation (except as specified in paragraph B.1 above) to disinfect domestic hot and/or water systems in conformity with procedure and standards described herein.
3. Disinfecting agent shall be chlorine gas (approved type for water system disinfection, and approved chlorinator), or hypochlorite, calcium or sodium, powdered or aqueous "Purex", "Clorox", or similar commercial product with 5.25 to sixteen percent (5.25-16%) available chlorine in water solution.
4. 3/4 inch service cock or valve shall be provided within three feet of the service connection for introducing a sterilizing agent into the lines.
5. After final pressure tests, each fixture or outlet shall be left wide open until flow shows only clear water.
6. With system full of water and under "main" pressure, all faucets shall be opened to permit simultaneous trickle flow.
7. The disinfectant shall be injected through the service cock by means of pump or other pressure device at a slow, even, continuous rate until an orthotolidine test at each outlet shows chlorine residual concentration of at least fifty (50) parts per million (PPM).
8. All outlets and valves shall be closed, including service valve at main, and injection cock, to retain chlorinated water. This condition shall be maintained for twenty-four (24) hours.
9. An orthotolidine test, after twenty-four (24) hour period, shall indicate a chlorine residual concentration of not less than 50 PPM. If not, the disinfection procedure shall be repeated until this standard is attained.
10. After satisfactory completion of above test, the system shall be flushed out until orthotolidine tests show chlorine residual of less than 0.5 PPM.
11. After satisfactory completion of disinfection procedure, the University Environmental Health & Safety Department may issue a temporary approval for immediate use of the piping system pending results of a bacteriological analysis of water samples.
12. After final flushing, water samples shall be bacteriologically tested and shall provide negative for coli-aero-genes organisms.
13. Analysis shall indicate total plate count less than one-hundred (100) bacteria per cubic centimeter, or equal to the control sample.
14. Upon satisfactory completion of bacteriological analysis, written approval of water system disinfection results shall be given to the Project Manager by the Environmental Health & Safety Department. If the analysis results are not satisfactory, the disinfection procedure shall be repeated until the specific standards are met.
SECTION 23 05 00
COMMON WORK RESULTS FOR MECHANICAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The scope of work covered by these specifications includes the complete installation of all mechanical HVAC (Division 23), Plumbing (Division 22), and Fire Protection (Division 21) work for this project. The scope includes furnishing all equipment, material and labor necessary for complete and operable systems, including General Conditions and Division 1.

1.02 RELATED DOCUMENTS

A. Section 230529 - HVAC Hanger and Support for HVAC Equipment
B. Section 230700 - HVAC Insulation
C. Section 233000 - HVAC Air Distribution

1.03 DESCRIPTION OF WORK

A. The work includes but is not necessarily limited to the following general headings:
1. Provision of all mechanical HVAC, plumbing, and fire protection systems for work of this project.
2. Coordination with other trades.
3. Determine all items and quantities required.
4. Provide complete, continuous, operational, and functioning systems.
5. Fully coordinate with work of other Sections, including field verification of elevations, dimensions, clearance, and access.
6. Repair of all damage done to premises as a result of this installation and removal of all debris left by those engaged in this installation.
7. All rigging, hoisting, transportation, and associated work necessary for placement of all equipment in the final location shown.
8. Disassembly and re-assembly of any equipment furnished under this Section, should this be required in order to move equipment into final location shown on the Drawings.
9. All labor, materials, tools, appliances and equipment that are required to furnish and install the complete installation for this Section of the work including that which is reasonably inferred.
10. Cooperation with other crafts in putting the installation in place at a time when space required is accessible.
11. Temporary scaffolding necessary for performance of the work in Divisions 21, 22, and 23.
12. Cutting and core drilling required for work of Divisions 21, 22, and 23, including locating of rebar or coordination of locating rebar with the Contractor.
13. Cutting, drilling, notching for installed systems.
14. Waterproofing where necessary for installation under Divisions 21, 22, and 23.
15. Temporary and permanent stands, supports, and bases for equipment requiring them, including vibration isolation.
17. Temporary utilities as required to install work on Divisions 21, 22, and 23 including lighting, water, gas, electricity, etc.
18. Fees, permits, inspections, taxes, and approach from agencies that have jurisdiction over installation of Divisions 21, 22, and 23.
1.04 REQUIREMENTS OF REGULATORY AGENCIES
A. Codes: Provide work in accordance with appropriate standards, codes, and recommendations, including those of the following agencies:
1. 2016 California Building Code
2. 2016 California Plumbing Code
3. 2016 California Mechanical Code
4. 2016 California Fire Code
5. 2016 California Electrical Code and NEC, latest edition
6. 2016 California Energy Efficiency Standards
7. Underwriters Laboratories (UL).
9. CALOSHA.
10. California Code of Regulations (CCR) Title 8, 9, 22, and 24.
B. Energy Codes: All equipment, systems, and insulation installed in Divisions 21, 22, and 23 shall comply with the minimum requirements of 2016 California Energy Efficiency Standards.
C. Nothing in the Contract Documents shall be construed to permit work not conforming to the applicable laws, ordinances, rules, regulations.
D. When requirements of the Contract Document exceed requirements of applicable laws, ordinances rules, regulations, the requirements of the Contract Documents shall take precedence.

1.05 PERMITS, LICENSES, AND INSPECTIONS
A. Permits: The contractor shall pay for all permits required by work under Divisions 21, 22, and 23.
B. Inspections: All work shall be regularly inspected and inspector records shall be delivered to the Owner.

1.06 SUBMITTALS
A. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment.
B. Identify each substantial item by reference to the specification Section paragraph in which the items specified or drawing and detail number.
C. Organize submittals in the same sequence as they appear in specification Sections, articles or paragraphs.
D. Any mechanical, electrical, structural, or other changes required for the installation of any approved substantial equipment provided as part of the work of Divisions 21, 22, and 23 shall be made to the satisfaction of the Owner and Owner’s Representative at no increase in contract price. Approval by the Owner of the substituted equipment and/or dimensional drawings does not waive these requirements. Submit drawings of equipment spaces showing substituted equipment prior to installation.
E. Approval of equipment shall not be construed as authorizing any deviations from the approved contract documents unless the attention of the Owner and Owner’s Representative has been directed to the specific deviations.
F. Furnish upon request, complete installation instructions on all material and equipment to be provided a part of the Work of Divisions 21, 22, and 23 before commencing installation of same.

1.07 PRODUCT DELIVERY, STORAGE HANDLING
A. Identify materials and equipment delivered to site to permit check against materials list and shop drawings.
B. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract price.

1.08 EXISTING SYSTEMS AND UTILITIES SHUT-DOWN
A. After the Owner has taken occupancy of the building, give the Owner 2 weeks’ advance notice, in writing, of need to shut off existing utility services or equipment interruptions. No system shutdown shall be permitted without the expressed written approval from the Owner. Divisions 21, 22, and 23 shall plan the shutdowns well in advance. The Owner shall set the exact time for and execute shutdown. The request shall state what systems are to be shut down, what areas will be affected, how long the period will be, and what contingency plan is provided if the work cannot be completed within the specified time. This procedure must be established and followed in order to provide the Owner with the least amount of service interruption and the least amount of disturbance for the users of the affected areas.

1.09 SCHEDULING AND SEQUENCING
A. Cooperate with other trades in putting this installation in place at a time when space required is accessible, and in such a manner that all other work in this space may be installed as intended for the project. Schedule work and cooperate with the others to avoid delays, interferences, and unnecessary work, conforming to the construction schedule, making the installation when and where directed.

1.10 TEMPORARY USE
A. Should it become necessary to use the new portion of the system and the new equipment before the completion of this work, the Owner reserves the right to make use of same at its own risk and expense, but the temporary use of the equipment shall not constitute an acceptance of the plant or any part thereof in any way. The Owner will bear the cost of fuel and electrical current for such temporary use of the equipment.

1.11 GUARANTEE
A. See Division 1. See subsequent Sections for additional requirements. Defective parts will be replaced at no cost to the Owner.

PART 2 - PRODUCTS – NOT USE

PART 3 - EXECUTION

3.01 EXAMINATION
A. Arrange to meet with the Owner’s Representative at the job site before the work is started and discuss with them the various phases of the work and the procedure and preparation for testing and adjusting the systems.
B. The general arrangement and location of piping, ductwork, apparatus, etc., is shown on the Drawings or herein specified. Minor changes may be necessary to accommodate other work, new or existing, that may conflict with this work. Install this work in harmony with these trades and fully coordinate all work.
C. Visit the site of the work, take measurements, examine all areas where work is to be performed and get such other information necessary for proper execution of the work. Ascertain and check all conditions with the Drawings and Specifications, other trades, existing conditions and by what means the work is to be performed. No allowance shall subsequently be made for any extra expense due to failure or neglect to make such examination and correlation. Where revisions or
changes in the existing work are required to permit the installation of new work, they shall be made at no additional cost to the Owner. No allowance shall be subsequently made for any error or omission on the part of the contractor in this connection.

3.02 ACCURACY OF DATA

A. The Drawings indicate the general arrangement and location of piping, ducts, and equipment. Should it be necessary to deviate from arrangement or location indicated in order to meet architectural conditions or site conditions, or due to interference with other work, make such deviations as offsets, rises and drops in piping and ducts that may be necessary, whether shown or not, without extra expense to the Owner. Extreme accuracy of the data given herein and on the Drawings is not guaranteed. The Drawings and Specifications are for the assistance and guidance of this Section and exact locations, distances, and elevations shall be governed by actual site conditions.

3.03 COORDINATION ITEMS

A. Coordinate mechanical work with that of other trades in order to:
1. Avoid interferences between general construction, mechanical, electrical, structural and other specialty trades.
2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of mechanical equipment.
3. Indicate aisle ways and access ways required on coordinated shop drawings for roof equipment area, mechanical equipment rooms, data and telecomm rooms, corridors, ceiling spaces, shafts, corridors, ceiling space, shafts, laboratories, etc.
4. Coordinate with Structural retrofit work for construction sequencing.

B. Understanding of Work
1. The Contractor shall have studied, examined, and compared all of the contract documents, including all drawings and specifications. The contractor shall have a full understanding of how the work in this part is scheduled, phased, and installed with work of all other trades.
2. The Contractor shall include in this installation all piping, ductwork, devices, and equipment that are necessary for complete and operating systems as specified and as required.
3. Piping and ductwork from fixtures, outlets, and devices shall be connected full size to the nearest suitable main or riser.
4. Certain installations may be presented as typical, and full details are not repeated for each case. Contractor shall provide complete installation as if full details apply to each and every case, and make adjustments to typical details to suit each specific installation as part of the basic work.
5. Installation of work presented on the diagrams are applicable to the plans, and work depicted on the plans are applicable to the diagrams.
6. If there is a discrepancy in the drawings or specifications, the contractor shall figure the work based on the most stringent requirements to complete the installation and obtain clarification from the Owner Representative before installation.

C. Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

6. Where mounting heights are not detailed or dimensioned, install systems, materials and equipment to provide the maximum headroom possible. All work shall be above ceilings or ceiling line.

7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Coordinate with individual system requirements.

9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as is practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

12. Coordinate with the locations of electrical panels and avoid installing piping and ductwork over them. Electrical panels are purposely located and have priority for location. The contractor is responsible for all required piping and ductwork offsets to insure that the panels are located as designed and for any other conditions.

13. Perform system modifications recommended by the Test and Balance Agency after recommendations are accepted by the Owner Representative.

3.04 MANUFACTURER'S DIRECTIONS

A. Obtain and follow manufacturer's directions in all cases. Where manufacturer's directions are in conflict with the Drawings and Specifications, submit to Owner Representative for clarification before installing the work.

3.05 INSTALLATION

A. Manufacturer's Directions: Follow manufacturer's directions covering points not shown on the drawings or specified herein. Manufacturer's directions do not take precedence over drawings and Specifications. Where these are in conflict with the drawings and Specifications, notify the Owner's Representative for clarification before installing the work.

B. Carpentry, Cutting, Patching, and Core Drilling:
   1. Provide carpentry, cutting, patching, and core drilling required for installation of material and equipment specified in this division.
   2. No penetrations shall be sleeved, cut, or core drilled through concrete construction without a submittal indicating exact locations and sizes and specific written approval from the Owner’s Representative or unless specifically shown on the Structural Drawings.
   3. It is the Contractor’s responsibility to accurately size and locate all openings through the structure. The dimensions shown on the Structural Drawings are for general information only. Provide all specific sizes, dimensions, requirements, etc.

3.06 QUALITY CONTROL

A. Measurements: All materials installed shall be to exact field measurements as determined by Divisions 21, 22, and 23.
B. The installation depicted on the Drawings is designed to fit tightly into work under other Sections or Divisions. It is the essence of this Contract that all work be completely coordinated with all other Sections or Divisions, and that all locations of pipes and ducts be exactly determined in the field and cleared with all other Sections or Divisions before the installation of these items is begun. No extra compensation will be made for failure to observe this clause.

C. Adequate clearance for access to all operable devices and all automatic devices and for access to all lubrication points shall be maintained in all portions of the work.

D. Provide access panels where shown and where required for access to all equipment and operable devices.

E. Gauges, thermometers, and other indicating devices shall be installed so that they may be easily read from the floor.

F. Finish work shall present a neat and workmanlike appearance.

G. Protection of Equipment
   1. Take responsibility for damage to any of the work or premises before acceptance. Should any new or existing equipment become damaged, restore it to its original condition and finish before final acceptance. Damage incurred to the Owner’s properties, neighboring properties, or to the work of other Divisions, caused by Divisions 21, 22, and 23, shall be replaced or repaired by, and at the expense of, Divisions 21, 22, or 23 to the satisfaction of the Owner’s Representative. All exposed materials shall be clean at the time of acceptance of the project.
   2. Exercise care during construction to avoid damage or disfigurement of any kind. Protect equipment from dust and moisture prior to and during construction.
   3. Where required or directed, construct temporary protection for equipment and installations for protection from dust and debris caused by construction.
   4. All protection shall be substantially constructed with the use of clean canvas, heavy plastic, visqueen and plywood, as required, and made tight and dust proof as directed.
   5. Repair by spray or brush painting, after properly preparing the surface, all scratches or defects in the finish of the equipment. Only identical paint furnished by the equipment manufacturer shall be used for such purposes.
   6. Failure to protect the equipment as outlined herein shall be grounds for rejection of the equipment and its installation.

3.07 CLEANING AND INSPECTION

A. Thoroughly clean and test all equipment and material before insulation is applied, systems tested, or put into operation.

B. Cleaning shall be as specified under the specific Sections in Divisions 21, 22, and 23.

C. The intent of this Specification is that all equipment and material furnished by Divisions 21, 22, and 23 shall be completely dust-free, clean and rust-free, and freshly painted when the final inspection is made.

END OF SECTION
SECTION 23 05 29

HANGER AND SUPPORTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. All carpentry, masonry and steel fabrication involved in making stands and supports for equipment installed under this Divisions 21, 22, 23 and 25, unless specified otherwise.
   B. Furnishing and setting of sleeves, rods, inserts, and support and bracing devices for all piping, ductwork and equipment installed under this Divisions 21, 22, 23 and 25.
   C. Complete closing and sealing of all openings around pipes, conduits and ducts furnished under Divisions 21, 22, 23 and 25. Maintain all fire separations.

1.02 RELATED DOCUMENTS
   A. Section 230500 – Common Work Results for Mechanical
   B. Section 230700 – HVAC Insulation

1.03 SUBMITTALS
   A. Submit in accordance with Division 1 and Section 23 05 00 – Common Work results for Mechanical.
      1. Connections to structure.
         a. Weight, calculations of loads, anchor sizes and imbed depths.
         2. Steel for supports.

1.04 OPERATIONS AND MAINTENANCE
   A. Submit under provisions of Division 1 and Section 23 05 00 – Common Work results for HVAC.
      1. Support devices.
      2. Anchor devices.
      3. Seismic bracing devices, systems, and calculations

1.05 REGULATIONS
      2. Expansion Anchors: California Building Code

1.06 SCOPE
   A. Contractor is responsible for design/build of all the Div. 21, 22, 23 and 25 utility support and seismic restraints as specified by this section.

PART 2 - PRODUCTS

2.01 ATTACHMENTS TO STRUCTURE
   A. Connection to Existing Timber Construction: Lag screws or through bolts.
   B. Clamp Connection to Steel Beams: B-Line, Grinnell, Superstrut, or equal, beam clamp with retaining clip style as required by load.
Hanger and Supports for HVAC Equipment

2.02 SUPPORTS, BRACING, AND ACCESSORIES

A. Miscellaneous Steel: Angles, channels, brackets, rods, clamps, etc., of new materials conforming to ASTM A36.

B. Fasteners: All bolts and nuts, except as otherwise specified, shall conform to ASTM Standard Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307. Bolts shall have heavy hexagon heads, and nuts shall be of the hexagon heavy series. Provide bolts of ample size and strength for the purpose intended.
   1. All bolts, washers, nuts, anchor bolts, screws and other hardware used outdoors or inside air plenums, shall be galvanized, and all galvanized nuts shall have a free running fit.

C. Sheet Metal Screws: Plated, size 10 minimum.

D. Hanger Rods: B-Line, Grinnell, Superstrut, or equal, plated steel rods, threaded, with a minimum safety factor of 5 over the imposed load.
   1. Hot-dip galvanized for outdoor installations.

E. Pipe Hangers: See Section 232113 – Hydronic Piping and Valves. Provide rod sizes to meet Section 232113 requirements.

F. Duct Hanger Straps: 1-1/4” wide x 18 ga sheet metal.

PART 3 - EXECUTION

3.01 ATTACHMENTS TO STRUCTURE

A. Steel Structure: Attach at beam axis. Avoid eccentric loads wherever possible.

B. Rating: Ultimate strength at least five times the imposed load.

C. Submit for Structural review all pipe hanger locations, point loads and structural attachment details for pipes 6” and larger.

D. Where point loads, imposed by work of Divisions 21, 22, and 23, are greater than can safely be carried by the deck; provide structural steel spreader beams tied to the building structure. Submit details of all such spreader beams for approval.

3.02 SUPPORTS AND ACCESSORIES

A. This Section is responsible for the proper selection and sizing of all support elements of any single or trapeze systems that include duct, pipe, and/or electrical conduit or cable trays.

B. Pipe Support:
   1. Support all pipe from the building structure so that there is no apparent deflection in pipe runs. Do not support from, or brace to, ducts, other pipes, conduit, or any materials except building structure. Piping or equipment shall be immobile and shall not be supported or hung by wire, rope, plumber’s tape, plastic ties, or blocking of any kind. Any exposed or concealed piping which can be physically moved, and which is not properly supported will not be accepted, and additional support or bracing will be required.

C. Duct Support:
   1. Ducts Supported From Above: Attach to structure using specified attachments. Minimum rod or bolt size is 3/8”.
   2. Double fold strap at attachment to structure or use single fold and washer.
   3. Duct straps shall be used in concealed installation only. Use threaded rods and strut systems or gripple cable for exposed installation.

END OF SECTION
SECTION 23 07 00
HVAC INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Thermal and acoustic insulation for pipes, ducts.

1.02 RELATED DOCUMENTS
A. Section 230500 – Common Work Results for Mechanical

1.03 SUBMITTALS
A. Submit in accordance with Division 1 and Section 23 05 00 – Common Work results for Mechanical.
   1. Duct insulation
   2. Application procedures

1.04 OPERATIONS AND MAINTENANCE DATA
A. Submit under provisions of Division 1 and Section 23 05 00 – Common Work results for HVAC.
   1. Duct insulation

1.05 CODES, REGULATIONS AND STANDARDS
A. Underwriters’ Laboratories Test Method No. 723: Fire Hazard Classification
B. Mechanical, Plumbing, Fire, and Energy Codes of latest issues
C. Factory Mutual Standards.

PART 2 - PRODUCTS

2.01 GENERAL
A. Manufacturers: Owens-Corning Fiberglas Corp., Knauf, Schuller, Certain-Teed, Armstrong, or equal.
B. Fire Hazard: Provide insulation, jackets, facings adhesives and accessories acceptable to the State Fire Marshal, and meeting the requirements of NFPA 90A. Meet the following hazard classifications stated in accordance with U.L. Test Method of Fire Hazard Classifications of Building Materials, No. 723:
   1. Flame spread: Maximum 25.
   2. Fuel Contributed: Maximum 50.
   4. Test results shall be available from an approved testing laboratory to indicate that hazard ratings for materials do not exceed the above amounts.

2.02 DUCT INSULATION
A. Concealed Supply and Return Air Ducts within Building: Insulate on the outside with minimum 1-1/2” thick blanket material of fine inorganic glass fibers with foil face.
   1. Density: Not less than 0.75 lb. per cu. ft.
   2. Minimum installed R value: 4.2 Hr. deg F ft²/ BTU, at 68 deg F. mean temperature.
   3. If internal insulation is shown on the Drawings then external insulation is omitted.
B. Transfer and Exhaust Ducts Within Building
1. General: Except for internal acoustic insulation as specified in Section 23 30 00 – HVAC Air Distribution, or as otherwise noted, they shall not be insulated.

2.03 ATTACHMENT DEVICES, CEMENTS AND FINISHES

A. Clip Pins: DuroDyne, or equal, 18-gauge metal stick-pins with self-locking steel washers suitable for welding or glue-on attachment to sheet metal.

B. Pipe insulation Adhesive: As recommended by the insulation manufacturer.

C. Pipe Insulation Jacket:
   1. Indoors: None
   2. Outdoors: Pre-formed 0.016” aluminum

PART 3 - EXECUTION

3.01 GENERAL

A. Apply all insulation in a neat and workmanlike fashion, in maximum continuous lengths, with all butt and lap joints and seams secured.

3.02 DUCT INSULATION

A. Materials
   1. Concealed Supply Ducts within Building: Specified blanket insulation without additional jacketing, unless internal insulation is required.

B. Where it is not possible to insulate ducts after installation, insulate duct before final installation. Tightness of work shall not be accepted as a valid reason for omitting any insulation. Where insulation is omitted, ducts shall be removed, insulated and reinstalled.

END OF SECTION
SECTION 23 30 00

HVAC AIR DISTRIBUTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. All duct systems related to heating ventilating and air conditioning as indicated on the Drawings and specified herein. Provide complete, continuous, operational, and functioning systems, fully coordinated with work of other Sections.

B. Work includes, but is not necessarily limited to, the following:
   1. Ductwork
   2. Duct accessories
   3. Air Inlets and outlets

1.02 RELATED DOCUMENTS

A. Section 230500 – Common Work Results for Mechanical
B. Section 230529 – Hangers and Supports for HVAC Equipment
C. Section 230700 – HVAC Insulation

1.03 SYSTEM DESCRIPTION

A. Low pressure ductwork (2" w.c.) includes:
   1. All galvanized supply, return, and relief ductwork.

B. Ductwork Construction Schedule

<table>
<thead>
<tr>
<th>System</th>
<th>Galvanized Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Exhaust</td>
<td>X</td>
</tr>
<tr>
<td>Supply and Return Duct</td>
<td>X</td>
</tr>
</tbody>
</table>

C. Duct pressure classification shall be as specified herein and not as recommended in SMACNA publications

1.04 SUBMITTALS

A. Submit in accordance with Division 1 and Section 23 05 00 – Common Work Results for Mechanical.
   1. Ductwork.
   2. Duct accessories.
   3. Air inlets and outlets

1.05 REGULATIONS

A. U.L. Label: Fire dampers, insulation and sealants, flexible duct.
B. Unless otherwise noted comply with SMACNA HVAC Duct Construction Standards, latest edition.
E. A.D.C. Certification: Performance and Acoustic Data for air inlets and outlets.
F. NFPA 90A.

PART 2 - PRODUCTS

2.01 GENERAL
A. Capacity and Performance: See drawings for nominal selections.
   1. Provide necessary calculations for correct sizing of the equipment for the specific applications.

2.02 DUCTWORK
A. Sheet Metal for Ducts: G90 galvanized steel sheets conforming to ASTM A-525 and A-527, lock-forming grade, of gauges as specified hereinafter, except where another material is specifically indicated. See PART 3 - EXECUTION - DUCTWORK, and drawings for duct construction requirements.

2.03 DUCT ACCESSORIES
A. Volume Dampers:
   1. Multi-Blade Dampers: 16-gauge galvanized steel blades with maximum blade width 6", 1/2" diameter steel continuous shafts in bronze bearings and 1-1/2" x 1/2" x 1/8" welded structural steel channel frames. Dampers shall be opposed blade with other details as shown in Sheet Metal and Air Conditioning Contractors’ National Association "HVAC Duct Construction Standards", First Edition, 1985, Fig. 2-15. Manual Operating Quadrants: Ventlok #641 with #609 end bearing, Elgen, or equal, with gaskets. Saw cut shaft end 1/16" deep parallel with damper blade. Size and install dampers with their frames outside of the air stream.
   2. Single Blade Dampers: 18-gauge galvanized steel 12" maximum width blade, with V-crimp at edge and center of blade. Dampers shall have 3/8" continuous square steel shafts with operators and end bearing as specified above. Other details shall be as shown in Sheet Metal and Air Conditioning Contractors’ National Association "HVAC Duct Construction Standards" Fig. 2-14A, round dampers shall be similar with V-crimp at edge omitted. Saw cut shaft end 1/16" deep parallel with damper blade.
   3. Where access to damper operators on ducts is not possible, such as hood ceiling areas, provide remote operators, Ventlok #666, Elgen, or equal, with paintable finish steel cover and waterproof gasketing. Cover shall be oversized to lap finished surface 3/8" all around. Provide extended control rods and/or Young #917, Ventlok #680, or equal, miter gears for making right angle turns. Submit samples. Cable type operators are not acceptable.
   4. Manual operating quadrants: DuroDyne Spec-Seal or equal (no known equal), air tight, zero leaks, rattle-free damper regulators.

B. Turning Vanes: Supply ducts only, unless specifically shown elsewhere. Shall be 90 degree, non-adjustable double thick turning vanes. Fabricate and install in accordance with SMACNA "HVAC Duct Construction Standards", Figures 2-3 and 2-4.

C. Duct Sealant:
   1. United Duct Sealer, 3M #800, or equal, non-flammable, U.L. labeled.

D. Gasket Material:
   1. For non-fume exhaust duty: Tremco 440, Ductmate 440, or equal, minimum 3/16" thick by 1/2" wide.

2.04 INTERNAL ACOUSTIC INSULATION
A. Owens-Corning Aeroflex, Certainteed or equal, made of long glass fibers with a flexible, black, abrasion resistant coating. If internal insulation is shown on the drawings, then external insulation is omitted.
   1. 3 lb. density.
   2. Thickness: One inch thick at all other locations unless otherwise indicated.
   4. Install only where specifically shown on the drawings.

B. Joint Sealant: Glass cloth and Arabol E1658B, Foster 30-36, or equal UL listed product.
2.05 AIR INLETS AND OUTLETS

A. Manufacturers: Titus, Air Factor, Krueger, Metalaire, or equal. Model numbers below are Titus unless otherwise noted.

B. Performance, neck size, and overall size as shown on the drawings.

C. Frame: As required for intended ceiling or wall installation. Provide drop face where used with drop-face or tegular ceiling tiles.

D. Color: As directed.

E. Performance and Acoustic Data: Per ADC Equipment Test Code 1062 and ASHRAE 70.

F. Dampers: Provide a duct mounted volume damper for each device unless specifically noted otherwise. Opposed blade dampers at the inlets and outlets are not required, unless shown on the Drawings.

PART 3 - EXECUTION

3.01 DUCTWORK

A. Where not otherwise specified herein, shown, noted, or required by codes, work shall conform to "HVAC Duct Construction Standards, Metal and Flexible," latest edition, as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc., (SMACNA).

1. 2" w.g. class for herein specified low pressure ductwork.

3.02 DUCT CONSTRUCTION

A. Duct Placement and Fittings:

1. Form transitions with uniform taper not exceeding 15 degree included angle, unless shown otherwise on Drawings.

2. Offsets over 15 degrees shall have two radius turns or square turning vanes.

3. Where it is not possible to insulate ducts after installation, ducts shall be insulated before final installation. Tightness of work will not be accepted as a valid reason for omitting any insulation. Where insulation is omitted, ducts will be removed, insulated and reinstalled.

4. Exposed Ducts: Exercise extreme care to produce neat and pleasing-in-appearance joints, connections, supports and other modifications. Ducts shall have no offsets, dents or dings. They shall be clean and grease-free. Remove all excess sealant. Appearance must be acceptable to the Owner's Representative.

5. Install ducts true to line and grade.

6. Make changes of direction by curved sections with inside radius equal to duct width or square elbows with turning vanes as shown; for tight spaces, elbows with inside radius equal to half or quarter are allowed. No square elbows are allowed for exhaust.

7. Closely fit and accurately place ducts and coordinate with work of other trades. Ducts must be so placed that piping, ceiling support grid, ceilings, and light fixtures may be installed without warping, springing or deforming ducts.

8. Attach specified joint reinforcement and intermediate stiffener angles to ducts with 3/4" long welds or 3/16" diameter rivets 12" on center unless indicated otherwise.

9. Angles and standing seams on ducts exposed in occupied areas shall have the corners chamfered 45 deg with 1/4" rounded edges and ground smooth.

10. Seal all duct penetrations through walls and floors at Vivarium for vermin proofing.

11. Provide inlet and outlet duct transitions at reheat coils, constant, variable, and air flow control terminal whether or not such transition is shown on the drawings. Coordinate work with electrical.

B. Low Pressure Rectangular Ductwork (2" w.c.):

1. Longitudinal seams: Flat crimped Pittsburgh lock with internal RTV Sealant, 3M #800, or equal, applied over seam.
2. Transverse Joints: Ductmate 35, TDC, or equal with specified gasket.
3. Cross break or bead all sides.

C. Round Ductwork - HVAC:
1. Provide spiral round ductwork where shown on the drawings.
2. At the Contractor's option round ducts up to and including 20 inches in diameter may be substituted for rectangular ducts provided that the cross-sectional area of the round duct is equal to or greater than the rectangular duct. As with other substitutions the contractor bears all responsibility for equivalency, fit, clearances, coordination, etc.
3. Duct construction shall be per SMACNA standards.
   a. Low Pressure:
      1) Elbows: 26 gauge smooth. Pleated not allowed.
      2) Adjustable Elbow: 26 gauge Uniweld. Spot welded and sealed joints (only allowed at tight locations).
   b. Medium Pressure:
      1) Elbows: 24 gauge die-stamped. All welded joints.
      2) Other: 24 gauge uniform spot welded, and sealed. All welded joints.
      3) Elbows: Radius to center of duct shall not be less than 1.5 times the diameter of the duct.
      4) Reducers: Machine formed to ASME short flow nozzle shape.
      5) Tees: Conical tap machine formed to short flow nozzle shape.
      6) Laterals: Machine formed to ASME short flow nozzle, conical tap at 45 deg F.
      7) Round tap fittings: Saddle type for round duct or conical for rectangular ducts as shown on the Drawings.
5. Round Duct Joints: Join by means of couplings with swaged bead in center and secured with sheet metal screws at each end of coupling. Make duct-to-fittings joints by either a tight slip fit of the fitting lapped inside the duct or by means of couplings with swaged bead in center, all secured with sheet metal screws. Screw spacing: 6", unless otherwise shown on the Drawings. Seal joints and seams with 4" wide Hardcast tape or specified internal sealant applied continuously around the coupling.

D. Duct Support
1. Attachments to Structure:
   a. See Section 230529 – Hangers and Supports for HVAC Equipment.
   b. Minimum rod or bolt size is 3/8".
   c. Where point loads imposed by work of Division 23 are greater than allowed value as directed by the structural engineer, provide structural steel spreader beams tied to the building structure. Submit details of all such spreader beams for approval.
   d. See structural drawings for additional restrictions for locating anchors.
   e. Wood Structure: Lab screws and sized to handle load.
   f. Rating: Ultimate strength at least five times the imposed load.
   g. Submit for structural review all support locations, point loads and structural attachment details.
   h. Coordinate installation so that attachments to structure are made prior to fireproofing or new concrete being poured.
   i. If attachments must be made after fireproofing, then thoroughly clean area of fire proofing before welded or bolted attachments are made and replace fireproofing as necessary.
   j. Conform to the requirements of CBC Section 1925 A-1, "Anchorage to Concrete," and Section 1925 A-3-5 "Drilled-in Expansion Bolts."
2. Indoors:
   a. Suspend horizontal rectangular ductwork 48" or less in largest dimension from construction by 1" x 18 gauge galvanized strap hangers screwed 8" o.c. to ducts. Use three screws minimum per strap. Bend strap under duct and screw into bottom of duct.

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b. Suspend horizontal stainless steel 48" or less in largest dimension from construction by 1" x 18 gauge galvanized steel strap hangers bolted to mating flanges at minimum of three locations. (Top, middle, and bottom).

c. Ducts over 48" in largest dimension support from Unistrut, Superstrut, or equal, trapeze hangers sized for the load, per SMACNA standards.

d. Support round and flat oval steel ductwork from construction by 1" x 18 gauge galvanized strap hangers with inside radius of loop hanger equal to outside radius of duct. For ducts under 12" diameter, provide supports 10'-0" o.c.; 12" and over, 6'-0" o.c. Provide not less than one hanger per branch and at each change of direction.

e. Support round flexible ductwork at diffuser inlets using1-1/2" x 22 gauge galvanized strap hangers with inside radius of loop hanger equal to outside radius of duct. Locate supports to avoid kinks and sharp bends.

f. Double fold straps at attachment to structure.

g. Space Hangers not over 96" on center for ducts smaller than 18" in largest dimension; 60" o.c. for ducts 18" and over.

3.03 DUCT ACCESSORIES

A. Duct Access Doors: Install in ducts and in plenum walls where shown and where required for cleaning and for access to equipment and devices in ducts, including access to duct smoke detectors provided under Division 26. Doors shall be airtight. Provide access doors upstream of reheat coils at variable volume terminals and duct mounted reheat coils.

1. Access door in plenums shall be as shown on the Drawings.

B. Volume Dampers:

1. Volume dampers are required on each branch of supply, return, and exhaust ductwork. Install where shown on the Drawings. Where not specifically shown, install damper as far upstream from air outlet/inlet as possible.

2. Provide remote damper operator, whether noted on the Drawings or not, wherever volume dampers above the ceiling are not readily accessible. Obtain Owner's approval for location prior to installation of any remote damper operator. Securely fasten operators to ceiling or wall construction so that operator box is flush with the finished surface and cover overlaps finished surface.

3. All dampers shall operate smoothly, without binding, throughout the entire 90 deg range; full open to full closed. Single leaf dampers shall have no more than 5 percent open areas for edge and end clearance when tightly closed. Dampers shall be rigid on operating rods and shall not produce any objectionable vibration, noise, or pressure drop in normal operating positions.

C. Fixed Turning Vanes: Not allowed in exhaust ducts. Install specified vanes in square elbows. Vanes shall run full diagonal dimension of elbow with first vane tight in heel corner. When turning vanes are installed in duct with internal insulation, install 20 gauge hat channels of same depth as insulation, and secure vane runners to channels.

D. Tap-In Fitting: Fabricate and install fittings with 45 deg flared inlet for rectangular duct or conical inlet for round duct in accordance with SMACNA "HVAC Duct Construction Standards".

3.04 INTERNAL ACOUSTIC INSULATION

A. Insulate supply and exhaust ducts as noted in the drawing on the inside.

B. Rectangular duct insulation shall be attached to duct with 100 percent coverage adhesive plus Omark 12 gauge Insul-Pin, Duro Dyne, or equal, metal clips, with self-locking steel washers, attached to sheet metal with pin welder gun on no less than 18 inches O.C. each way and 6 inches O.C. along all joints and edges.

C. Round duct insulation shall be attached to duct per manufacturer's recommendations.
D. Neatly apply specified sealant, to seal all insulation joints, seams, and edges. Ensure full sealant coverage over joints, seams and edges. Installed insulation shall be suitable for 4,000 FPM air velocity. Clip off all pins inside ducts.

E. Install metal nosing over the liner edge on the upstream end.

F. All adhesive and insulation material shall be fire-retardant, and U.L. listed.

3.05 AIR OUTLETS AND INLETS

A. Diffusers and Registers: Except where indicated, angular offsets, box connections, and other irregular connections at diffusers and registers are prohibited. Where location of diffusers and registers is governed by work in other Sections, such as integrated ceilings, set diffusers and registers to dimensions taken from Section performing the other work.
   1. Paint sheet metal flat black where visible through inlets and outlets.

B. Support duct elbow directly above each ceiling diffuser, register, and grille to structure with two 1" x 18 gauge sheet metal straps. Fasten diffuser, register, or grille to duct drop with minimum two #10 sheet metal screws on each side. In addition, for lay-in ceiling, support each duct or unducted diffuser, register, and grille to structure above with two #12 gauge steel wires or two 1" wide x 18 gauge sheet metal straps fastened to opposite corners.

3.06 SEALING

A. Where firestopping is not required, seal all duct, pipe, and conduit penetrations through partitions at all floors and through interstitial floor with G.E. silicone sanitary sealant, Dow Corning 8650 Interior Sealant, or equal.
   1. Provide 0.125- to 0.25-inch gap to be filled with specified sealant for noise and/or vermin control.

B. Do not seal at fire dampers in any way that violates UL or code installation requirements.

3.07 GALVANIZING REPAIRS

A. Repair galvanizing damaged by welding, scratches, etc., using Z.R.C., no known equal, cold galvanizing compound.

3.08 CLEANING

A. Clean all air ducts so that no dirt or dust is present in any system.

B. Patch, repair or replace duct work as required. All ductwork shall be made absolutely air tight. Repair or replace ducts and joints as required to the satisfaction of the Owner.

C. Clean existing diffusers removal for structural work prior to reinstallation.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The scope of work covered by these specifications includes the complete design and installation of all electrical work for this project. The scope includes furnishing all drawings, calculations, design, equipment, material and labor necessary for complete and operable systems, including General Conditions and Division 01.

1.2 RELATED SECTIONS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 260502 - Basic Materials and Methods
   2. Section 260529 - Hangers and Supports for Electrical Systems
   3. Section 265020 - Lighting Controls
   4. Section 265100 - Lighting

1.3 DESCRIPTION OF WORK

A. The work includes but is not necessarily limited to the following general headings:
   1. Plan check/permit process.
   2. Shop drawings and submittals.
   3. Record as-built documents.
   4. Operations and maintenance manuals.
   5. Equipment and systems training for Owner’s personnel.
   6. Testing
   7. Commissioning.
   8. Cutting, drilling, notching for installed systems.
   9. All bases, seismic bracings, supports and hangers for installed systems.
   10. See subsequent sections for detailed descriptions.

1.4 CODE COMPLIANCE AND REFERENCES

A. All work and materials shall comply with the latest adopted rules, codes and regulations, including, but not necessarily limited to:
   5. National Electrical Manufacturer's Association Standards (NEMA).
   6. American National Standards Institute (ANSI)
   10. Occupational Safety and Health Act Standards (OSHA).
   11. Institute of Electrical and Electronics Engineering Representatives (IEEE).
   12. All other applicable Federal and State and local laws and regulations.
B. Compliance with code is mandatory. These drawings and Specifications do not allow work not conforming to these codes. Where work is shown to exceed minimum code requirements, comply with drawings and Specifications.

C. Give necessary notices, obtain permits, pay taxes, fees and other costs in connection with work, file necessary plans, prepare documents, and obtain necessary approvals of the authorities having jurisdiction. Obtain all required Certificates of Inspection for work and deliver to Owner's Representative before request for acceptance and final payment of work.

D. Include in the Work: labor, material, services, apparatus, drawings (in addition to Contract drawings and Documents) required to comply with applicable laws, ordinances, rules and regulations. Examples of these drawings are those required to be submitted to the Fire Marshal for approval.

E. References
   1. ASTM A-36: Structural Steel Shapes and Plates.
   2. ASTM A-501: Steel Tubing.
   3. ASTM A-53: Steel Pipes, Grade B.

1.5 DEFINITIONS

A. "Authorities having jurisdiction" means all governmental, utility, building, and fire protection authorities having jurisdiction.

B. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, or embedded in construction.

C. "Contract Documents" means drawings and specifications.

D. "Drawings" means any drawings of the Bid Documents.

E. "Exposed" means not installed underground or "concealed" as defined above.

F. "Furnish" means to supply and deliver to the job.

G. "Or equal" means any equipment or material which, in the opinion of the Owner, is equal in quality, durability, appearance, strength, design and performance to the equipment or material specified and will function adequately in accordance with the General Design.

H. "Provide" means supply, erect, install, and connect up complete in readiness for regular operation, the particular work referred to.

I. "Wiring" includes, in addition to conductors, all raceways, conduit, fittings, boxes, switches, hangers and other accessories related to such wiring.

J. Singular Number: Where any device or part of equipment is herein referred to in the singular number, such reference shall be deemed to apply to as many such devices as are required to complete the installation or as shown.

K. Reference abbreviations and Symbols: Refer to Drawings.
1.6 DRAWINGS AND SPECIFICATIONS

A. All drawings and Divisions of these specifications shall be considered as a whole, and work of this Division shown anywhere therein shall be furnished under this Division. Review contract documents of all Divisions and report to Owner all discrepancies between this Division and any other Division, before submitting bid. In case of conflict between the drawings and specifications or within the drawings, or within the specifications, Contractor shall base bid on the most stringent specifications and drawings requirements of any Division, and provide work accordingly. In case of conflict between the Code and drawings or specifications, the Contractor shall provide work that complies with Code as part of base bid. Scope of work excluded in one part of the document, but included in another part of the document shall be considered as required and included work of this Division. Use Campus Site Drawings as basis, and revise to include all new work for as built drawings.

B. Drawings are diagrammatic and indicate the general arrangement of equipment and wiring. Most direct routing of conduits and wiring shall be coordinated with other Sections and Division of this specification. Exact requirements shall be governed by architectural, structural and mechanical conditions of the job. Consult all other Sections, Divisions and drawings prior to execution of the work. Extra lengths of wiring or addition of pull or junction boxes, etc., necessitated by such conditions shall be provided as part of the work. Check all drawings, Sections, and Divisions of this specification and report, in writing, any apparent discrepancies before proceeding with the work. The most stringent requirements shown in any code, drawings, or specification Section, or Division shall be provided as part of the work, until informed to the contrary by the Owner.

C. Electrical motors, controllers, detectors, panels, switches, and other electrical devices requiring line voltage power supply shall be provided with conduits, wires, circuit breakers, and proper voltage and characteristics of that device by this Division, even though these devices or equipment are only shown on Architectural, Structural, Mechanical, Plumbing, Landscaping, Controls and drawings of other Divisions. Any electrical device or fixture shown on the drawings shall be wired based on its rating and information indicated on the documents or best arrangement as approved by the Owner Representative.

D. Should conditions require revision to space or rearrangement to suit design of equipment proposed for installation, shop drawings shall be submitted to show changes in the work. Arrange for the necessary space and revisions to work under other Divisions before proceeding with any work. Do not decrease sizes or make radical changes in the installation without written approval of the Owner. Contractor shall be held responsible for any changes made based on incomplete information or without approval.

E. By submitting a Bid, the Contractor represents that he has made a thorough examination of the site of the work and all existing conditions and limitations, and that he has examined all Drawings and Specifications in complete detail, and has determined beyond doubt that the drawings and specifications are sufficient, adequate, and satisfactory for the construction of the work under the contract. Any discrepancies found between the drawings and specifications shall be immediately reported in writing to the Owner for clarification. In case of conflict between the specifications and drawings or within the specifications, or within the drawings the Contractor shall base his bid and perform the work from the most stringent specifications and drawings requirements.

F. Immediately repair or replace all utility services and installations damaged in performing work under this Division at the expense of the Contractor causing the damage. Obtain written approval of the repair or replacement from the Owner.

G. If existing active utility services are encountered which require relocation, make request to proper authorities for procedures. Properly terminate existing services to be abandoned in conformance with requirements of authorities having jurisdiction.
H. Submit shop drawings of underground conduit routing and comply with applicable structural requirements to accommodate its installation before start of building foundation form work. Submit copy of these drawings to Owner.

1.7 RECORD DRAWINGS AND AS-BUILT DOCUMENTS

A. General: These documents shall be submitted in accordance with the requirements of Division 01.

B. Provide updated and corrected submittal to as-built conditions, including one separate set of reproducible drawings to be furnished to the Owner, after completion of all Work and before final acceptance. Include record copies of all submittal data, shop drawings, showing equipment locations, control panel layouts, complete point to point interconnection wiring diagrams, conduit routing, site underground conduit and site lighting. Use site drawings as basis, and revise to include all new works in as-built drawings.

C. Site Lighting and Underground Electrical Installation: Show on the as-built drawings the dimensions and actual location of underground conduits, power and miscellaneous systems, manholes and hand-holes, light poles, equipment, etc. Show layout, sketches and installation on same scale as contract electrical site plan drawings.

D. Building Interior Electrical Feeders and Miscellaneous Systems Conduit Installation: Show on the as-built drawings the dimensions and actual location of exposed, concealed, under building slab feeders and miscellaneous systems conduit installation including size of code required pull or junction boxes. Show layout, sketches and installation on same floor plan scale as contract electrical floor plans.

E. Lighting, Branch Circuits, Motor and Equipment Circuits, and Miscellaneous Systems: Show actual location of conduit homeruns to respective panels, terminal boards or equipment, and indicate location of conduits in slab, running up or down walls. Show these as-built drawings on same scale as electrical contract drawings.

F. Factory and field test reports for electrical equipment.

G. Protective device coordination and short circuit studies.

H. Contractor shall bear all costs associated to provide these as-built documents, including reproductions, drafting, etc.

I. Submit two sets of black and white printed drawings and one copy of electronic files to the Owner before final acceptance. All drawings shall be on full size sheets same as the contract drawings, and submit drawings in latest revision electronic autocad files.

J. Grounding System

1. Indicate on as-Built drawings the location of all ground rods, mats, grids, building ground bus, supplementary grounding electrodes, steel building columns, and other metal structures connected to the grounding system.

2. The location of each ground rod, ground rod assembly, and other grounding electrodes shall be identified by letter in alphabetical order and keyed to the record of ground resistance tests.

1.8 GUARANTEE

A. Provide in accordance with the requirements of Division 01. See subsequent sections for additional requirements. Detective parts will be replaced at no cost to the Owner.
1.9 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Submit in accordance with the requirements of Division 01.

B. Where the words "or equal" appear in these specifications, written request for substitution must be approved in writing per Division 1 requirements.

1.10 SUBMITTALS

A. Submit shop drawings and materials lists in accordance with the requirements of Division 01.

B. All proposed deviations from specifications must be clearly listed under a heading entitled "DEVIATIONS".

C. Submit number of sets of Operating and Maintenance Manuals of equipment as specified in Division 01, or as indicated in Section specifying equipment.
   1. Operations and Maintenance Data
      a. Upon completion of the work, submit operating and maintenance manuals as specified in Division 01. Include all shop drawings, instruction sheet, bulletins and all pertinent information required by the Owner for proper maintenance, operation, and adjustment of each and every piece of equipment furnished. Provide information in hard copy, one set, and in CD-ROM format, 5 copies. Do not include information which does not concern equipment actually furnished. Include information for all items mentioned under "Submittals" in subsequent section.

D. For specific requirements, see the Sections in which the equipment is specified.

E. Shop Drawings: Submit the following Drawings at 1/4" scale or larger prepared in AutoCad 2010 format or Owner’s input.
   1. Shop Drawings, equipment, cuts, catalogs or descriptive literature with complete certified characteristic of equipment, dimensions, schedules, wiring diagrams, catalog numbers, code requirements and manufacturer's requirements. Clearly delineate and show options that are provided for the equipment.
   2. Resubmitted shop drawings: make corrections noted from previous submissions.
   3. Work shall not proceed until Shop Drawing or sample has been reviewed and approved.
   4. Include manufacturer's specifications, physical dimensions and ratings of all equipment.
   5. Acceptance of materials and equipment does not relieve the Contractor of the responsibility of not complying with the Drawings and Specifications, unless the submittal clearly states that the equipment does not agree with the Drawings and Specifications and lists the deviations in paragraph 1.9.B of this section.
   6. Shop drawings shall include cable tray layout, feeder conduit runs, surface metal raceway layout and items specified in other sections of this specification.

F. Coordination Drawings: See Section 230500, "Common Work Results for HVAC." Participate with all other divisions to prepare separate coordination drawings.

G. Electrical Seismic Restraint System
   1. Submit complete shop drawings showing the locations and types of all seismic bracing for equipment, conduits, busducts, and cable trays. Include a complete bill of materials for each restraint, indicating the type and size of structural attachment, brace and conduit hanger assembly.
1.11 SUBMITTAL REVIEW

A. Check and coordinate all submittals with the requirements of the work and verify all quantities, materials and related field measurements and construction criteria.

B. Review by the Owner’s Representative is only for general conformity with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. No deviations from the contract documents are included in the review, unless specifically called to the attention of the Owner’s Representative by the Contractor, and responded in writing by the Owner’s Representative. Review by the Owner’s Representative shall not relieve the Contractor of responsibility for reviews and approvals that are required by Code authorities having jurisdiction, even if accomplished before those reviews.

C. Dimensions, quantity, finish, voltage, current, and phase are not included in the review. The Contractor shall verify the materials supplied under all Divisions and Contract Drawings. Any additional material or cost required by an approved substitution for any specified material or work shall be borne by the Contractor requesting the substitution. The Contractor is not relieved from complying with the plans and specifications or with any applicable codes and ordinances relating to his work, for the Owner Representative’s notes on the submittal review.

D. Contractor is responsible for all dimensions, which shall be confirmed and correlated at the job site, drawings and work of other Divisions, fabrication processes and techniques of construction, coordination of his work and materials with other trades, and the satisfactory performance of his work.

1.12 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle materials in a manner to prevent damage.

B. Comply with Division 01 and the following:
   1. Scaffolding, Rigging and Hoisting: Provide scaffolding, rigging, hoisting, and services under this Division. Remove same from premises when no longer required.
   2. Deliver materials or equipment to the project in the manufacturer's original, unopened and labeled containers. Protect the equipment and apparatus from damage caused by theft, construction debris and activities, weather, and all building operations. Failure to protect the materials and equipment adequately to the satisfaction of the Owner is sufficient cause for the rejection of any damaged materials or equipment. Close all equipment openings to prevent obstructions and damage. Do not deliver materials to the job before they are ready for installation, unless adequate security is provided.
   3. Take all precautions to guard against and eliminate fire hazards in connection with the Work under this Division.

1.13 SCHEDULING

A. In addition to complying with requirements of Division 01, Construction Schedule, and other sections of this Division, Contractor shall:
   1. Mount all motors, starters, contractors, and other devices furnished under other Divisions.
   2. Provide electrical power and wiring to all electrical appliances, equipment, devices, etc., indicated in Contract Documents, whether the item is provided under this Contract or noted as Not-In-Contract.
   3. Provide separate disconnect switches for all motors (3/4 H.P. or larger) and contactors where required by code or local conditions. Provide manually operated thermal starting switches with pilot light for all fractional horsepower motors (1/2 H.P. and smaller).
Provide manual control switch with pilot light for fractional horsepower motors equipped with built-in thermal protection.

4. Consult the Contract Drawings, Specifications, and Contractors of other trades to verify the location of building components and work to be installed by other trades. Arrange the work schedule with minimum interferences with the work of other trades.

5. Consult and cooperate with other Divisions and Sections for determining space requirements and adequate clearances to other equipment in the building. Owner reserves the right to determine space priority in the event of interference between piping, conduit, and equipment of various trades.

6. Remove, relocate, and reconnect work installed that interferes with work of other trade.

7. Provide shop drawings of critical areas to demonstrate that Code clearances are met.

8. Service Disconnection and Interruption:
   a. Service Interruption: All service interruptions shall be scheduled through the Owner by providing a notice 14 working days in advance. See Division 01 for other requirements.
   b. Service Disconnection: All circuits and equipment to be disconnected shall be traced by the Contractor to ensure that vital services to other areas are not interrupted.

1.14 INSPECTION OF CONDITIONS

A. Examine related work and conditions before starting work of this Division. Report to Owner in writing of conditions which will prevent proper installation of this work. Beginning work of this Division without reporting unsuitable conditions to Owner constitutes acceptance of conditions by Contractor. Perform required removal, repair, or replacement of this work caused by unsuitable conditions as part of the Base Bid.

B. Verify all measurements with architectural and structural drawings and at the job site and be responsible for their correctness. Contractor shall be responsible for making a proper and thorough investigation of these requirements.

C. Inspect the site to determine receiving facilities and storage space for unloading and storing of materials, equipment, and tools.

D. The Contract is based on the drawings, and specifications, and that the Contractor has investigated, understands, and accepts drawings and specifications and all existing conditions. No claims for extra compensation will be allowed later on account of differences between actual conditions and drawings and specifications.

E. During the Bid period; Contractor shall visit the site of the Work, take measurements, examine all existing areas where work is to be performed and get information necessary for proper execution of the work. Ascertain, check and compare all conditions with the Drawings and Specifications, other trades, existing conditions and where the Work is to be performed. If the Contractor did not visit the site, investigate, and compare the conditions with the drawing and specifications; Contractor will not be given additional money for work he may claim later because the existing condition are different with the drawings and specifications. Where revisions or changes in the existing work are required to permit the installation or new work, they shall be made as part of the work; no allowance shall be subsequently made for error or omission by the Bidder in this connection.

1.15 COORDINATION

A. Coordination Drawings
   1. Furnish layout of electrical work that requires coordination with other Divisions and shall include:
      a. Major conduit feeder layout.
b. Floor duct system layout, furniture connections.
c. Cable tray routing and locations.
d. Switchboard and panel locations.
e. Light fixture locations, book-shelves lighting installation and their under-ground conduit rough-in.
f. Pull box locations.
g. Vertical Lift electrical rough-in and connection.
h. Fire Alarm system layout.
i. Drawings shall be in AutoCad, Release 14 or latest version, 1/4" = 1'-0" scale, 30" x 42" size floor plans, including sections and elevations.

2. Furnish coordination drawings timely to meet construction schedule. Attend coordination meetings with the mechanical, plumbing, fire protection, structural and architectural trades before installation of work in this Division.

3. See Section 230500 1.07 coordination with Division 25. Contractor shall attend periodic job site coordination meetings. It is contractor’s responsibility to coordinate major electrical run, such as conduits, feeders, duct banks, floor duct system, cable trays and etc., with the 3D coordination model development. Otherwise, Contractor may have to pay for additional expense (money) as directed by Division one for assisting coordination of other trades in the development of the coordination.

B. Coordinate electrical work with other Divisions to:
1. Avoid interference among general construction, mechanical, electrical, structural and other trades.
2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of electrical equipment.
3. Indicate aisle-ways and access-ways required on coordinated shop drawings for electrical and telephone rooms, mechanical equipment rooms, computer rooms, laboratories, and kitchens.
4. All electrical materials and equipment shall be kept close to the ceiling, walls and columns to occupy the minimum amount of space and comply with code required access and clearances.
5. Furnish and install all offsets, fittings, and similar items necessary to accomplish the requirements of coordination, as part of the work.
6. Verify electrical rating of Vertical Lift, mechanical and plumbing equipment, and equipment furnished by other Divisions before conduit rough-in and delivery of protective circuit devices. Submit to the Owner written evidence that Contractor complied with this requirement. If Contractor did not do checking and proceeded with work and later have to change it because the electrical drawings are different from mechanical and other trades, Contractor shall be responsible for correcting work at no additional cost to the Owner.

1.16 PERSONNEL DEMONSTRATION AND TRAINING

A. Provide the Owner’s personnel with demonstration and training on the systems installed according to the amount of time indicated in individual equipment sections of Division 26.

B. Where two or more of the above systems are combined, the total training time for the combined system shall equal the sum of the training times for the individual systems.

C. Demonstration and training shall be done by qualified representatives of the equipment manufacturer. Notify Owner not less than two weeks in writing that work have been checked, tested and operated, and that the equipment and systems are working as specified, and that Contractor is ready to schedule demonstration and training.
PART 2 - PRODUCTS

2.1 MATERIAL

A. The design, manufacture and testing of electrical equipment and materials shall conform to or exceed latest applicable UL, NEMA, IEEE and ANSI standards.

B. All materials shall be new and bear UL label. Materials that are not covered by UL testing standards shall be tested and approved by an independent testing laboratory. The laboratory shall be acceptable to the Owner.

C. Furnish materials and equipment that are products of a reputable manufacturer regularly engaged in manufacture of the specified item. Where more than one unit is required of any item, furnish the equipment by the same manufacturer, except where specified otherwise.

D. Owner has the authority to require removal of material or work from the premises if work is not in accordance with the Drawings and Specifications. He may also require replacement of unsatisfactory work or material. Owner has authority to stop work whenever such stoppage may be necessary to insure proper execution of the Contract.

E. Furnish and install equipment necessary for proper operation of the system. Furnish, install, adjust, and leave in a safe and satisfactory condition all materials and equipment mentioned in the Specifications, shown on the Drawings, or both. Furnish and install supplies, appliances, and connections necessary to the proper operation of the equipment, including access doors where required.

F. Access doors shall be provided where required to access wiring and equipment and shall be sized as specified herein and in accordance with Code. Type, finish, location, fire rating, etc., shall be submitted for review. Access doors are not shown on the drawings and Contractor shall be responsible for locating and providing same as part of the work.

G. Compatibility of electrical systems with building control system: All equipment listed below shall be compatible with Division 23 building control system:
   1. Fire alarm system
   2. Electrical equipment energy monitoring and control systems
   3. Variable frequency drives

2.2 ACCESS DOORS AND PANELS

A. Access doors and panels: Specification of access doors and panels is under Division 8.

2.3 ELECTRICAL IDENTIFICATION MATERIALS

A. General: Provide manufacturer's standard products of categories and types specified and required for each application, except as otherwise indicated.

B. Color-Coded Conduit Markers:
   1. General: Provide manufacturer's standard pre-printed, flexible or semi-rigid, permanent, plastic-sheet conduit markers, and extending 360 degrees around conduits; designed for attachment to conduit by adhesive, adhesive lap joint of marker, matching adhesive plastic tape at each end of marker, or pre-tensioned snap-on. Except as otherwise indicated, provide nomenclatures which indicate the voltage or system of the conductors in conduit, e.g., 120/208 volts, normal or emergency power, fire alarm, etc. Provide 8” minimum length for 2” and smaller conduit, 12” length for larger conduit.
      a. Colors: Unless otherwise indicated or required by governing regulation, provide
orange markers with black letters. Use red markers for fire alarm conduits. Use yellow markers for telecommunications and signals.

b. Lettering: minimum 1-1/2" high.

C. Color Coded Plastic Tape:
1. General: Provide manufacturer's standard self-adhesive vinyl tape not less than 3 mils thick by 1-1/2" wide.
   a. Colors: Unless otherwise indicated or required by governing regulations, provide orange tape.
   b. Use red tape for fire alarm conduits. Use yellow tape for telecommunications and signals.

D. Cable and Conductor Identification Bands:
1. General: Provide manufacturer's standard vinyl-cloth self-adhesive cable and conductor markers of the wrap-around type; either pre-numbered plastic coated type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification.

E. Plasticized Tags:
1. General: Manufacturer's standard pre-printed or partially pre-printed accident-prevention and operational tags, of plasticized card stock with matte finish suitable for writing, approximately 3-1/4" x 5-5/8", with brass grommets and wire fasteners, and with approximate pre-printed wording including large-size primary wording (as examples; DANGER, CAUTION, DO NOT OPERATE).

F. Self-Adhesive Plastic Signs:
1. General: Provide manufacturer's standard, self-adhesive or pressure-sensitive, pre-printed, flexible vinyl signs for operational instructions or warnings of sizes suitable for application areas and adequate for visibility, with proper wording for each application (as examples: 208V, exhaust fan).
   a. Colors: Unless otherwise indicated or required by governing regulations, provide orange signs with black lettering.
2. Baked Enamel Danger Signs:
   a. General: Provide manufacturer's standard "Danger" signs of baked enamel finish on 20 gauge steel; of standard red, black and white graphics; 14" x 10" size except where 10" x 7" is the largest size which can be applied where needed, and except where larger size is needed for adequate vision; with recognized standard explanation wording (as examples: HIGH VOLTAGE, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH).

G. Engraved Plastic Laminate Nameplates:
1. General: Provide engraving stock melamine plastic laminate complying with FS-LP-387, in sizes and thicknesses indicated, engraved with standard letter style of the sizes and wording indicated, black letter style of the sizes and wording indicated, white background except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate. Use red background with white lettering for emergency power system and circuits, and fire alarm system.
   a. Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.
   b. Fasteners: Self-tapping stainless steel screws, except use contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

H. Circuit Identification Labels for switches, receptacles, exit signs and light fixtures.
1. Circuit identification tape labels shall indicate panel and circuit. Lettering shall be black color and 3/16" high on white background.
2. Apply on the front face of receptacle and switch coverplates.
3. Apply on light fixture junction box covers, exit sign mounting buses, and exterior of remote LED driver enclosures.
I. Pull Tapes
   1. Provide pull tape in all empty conduits. Pull tapes shall be labeled with footage markings, WP 25 Amco Bull Line AD technologies.

J. Lettering and Graphics
   1. General: Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled on the drawings. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification, and operation and maintenance of the electrical systems and equipment.
   2. Lettering Height and Nomenclature
      a. Lighting and receptacle branch circuit panelboards. Provide engraved nameplates.
         1) Nomenclature: Three lines minimum: first line - panel name e.g. PANEL L2A; second line - voltage, number of phases and wires e.g. 120/208V, 3-phase, 4W; third line - source of power, e.g. "fed from distribution panel "XXXX"
         2) Letter Height: 1/2 inch high first line, 1/4 inch for second and third lines.
      b. Distribution panels and transformers: same as lighting and receptacle panelboards.
      c. Disconnect switches and enclosed circuit breakers: same as lighting and receptacle panelboards.
      d. Switchboards: Provide engraved nameplates.
         1) Nomenclature: Three lines: first line-equipment designation, e.g. "main switchboard (or switchgear) "XYZ", second line - voltage and number of phases and wires, e.g. 480/277V, 3-phase, 4W; third line - source of power e.g., "Fed from North Vault" (indicate location of service).
         2) Letter Height: 1/2 inch high first line, 1/4 inch for second and third lines.
      e. Variable Frequency Drives, and Motor Control Center: same as switchboards.
      f. Terminal Cabinets and Pull Boxes: Provide engraved nameplates.
         1) Nomenclature: Minimum one line and indicate conductors or system contained; example: FIRE ALARM, 120/208 VOLTS, etc.
         2) Letter Height: 1/2 inch high.
      g. Junction and outlet boxes in ceiling spaces: On the outside face of the cover, identify panel and circuit numbers contained inside of outlet and junction boxes, with a black permanent felt pen marker.

2.4 FIRE STOPPING
   A. Comply with Division 7 requirements. Seal all electrical system components passing through fire rated walls and floors. HiHi, 3M or equal.

PART 3 - EXECUTION

3.1 COORDINATION
   A. Coordinate work with other trades and Divisions of these specifications to avoid conflict and eliminate delays, keep all trades informed of proposed installations under this Division, and to provide correct rough-in and connection for equipment furnished under trades. Inform other trades of the required access and clearances around electrical equipment to maintain serviceability and code compliance.
   B. Verify equipment dimensions and requirements with under this Section. Check actual job conditions before fabricating work. Make necessary changes in time to prevent needless work.
C. Prior to rough-in and conduit work, check electrical characteristics of all equipment to be supplied under other Divisions and this Division and compare with circuiting shown on the drawings and actual equipment. Examples of this are elevators, motors, mechanical units, kitchen equipment, doors, etc. Inform the Owner Representative of variance between equipment to be supplied and electrical drawings. Failure on the part of Contractor to do this checking and resulted in conflict with equipment and installed wiring, the Contractor shall correct work to suit equipment at no additional cost to the Owner.

3.2 QUALITY ASSURANCE

A. The specifications contained minimum acceptable requirements. Contractor shall provide a complete operating facility within the scope of this work. Comply with the requirement of Division 1.

B. Contractor shall ensure that workmanship, all materials employed, all equipment, and the manner and method of installation conforms to Code and accepted construction and engineering practices, and that each piece of equipment is in satisfactory working condition to perform its functional operation. The Contractor shall ensure that each individual piece of equipment operates in the overall system and is properly wired, and controlled to enable all electrical systems in the building to function properly together.

C. Grounding Connectors
   1. All connectors must meet the requirements of IEEE Standard 837.

3.3 MEASUREMENTS AND DIMENSIONS

A. Unless otherwise directed, or unless dimensions are shown on electrical drawings, obtain all dimensions from architectural, civil, structural, or mechanical drawings as applicable. Do not scale from electrical drawings, which are intended to be diagrammatic only.

B. Where the sign “+” followed by a dimension is shown on electrical drawings, it means the distance from finished grade or finished floor to the horizontal centerline of the electrical device or equipment.

C. Examine the areas and conditions under where work will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.4 MANUFACTURER'S RECOMMENDATIONS

A. Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the equipment or item shall not proceed until manufacturer's recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material.

3.5 FIRE STOPPING

A. Comply with Division 7 requirements. Seal all electrical system components passing through fire rated walls and floors.

3.6 CUTTING AND PATCHING

A. All cutting and patching required for work of this Division shall be included herein. Coordination with other Divisions shall be performed by the Contractor. Responsibility for and adjustment of
improper holes, supports, etc., shall be by the Contractor

B. Cut completed construction work only if sleeves, openings, chases, etc. where omitted, and only with specific permission of the Engineer. Reinforcing steel shall not be cut without written permission of the Owner.

C. Provide sleeves, caps, plates, escutcheons, flashing, etc., required to fill or close the openings. Provide final grouting, concrete, asphalt, masonry, painting and other surface materials as required. Make repairs in like and kind for exact matching of surfaces and finishes.

D. Where cutting and patching occurs in streets, sidewalks, alleys and the like, cooperate fully with Owner and municipal or other government bodies.

E. Perform all core drilling only as approved by the Owner Representative. Jack hammering is not permitted. Arrange for all patching required and seal floor penetrations watertight. Before starting drilling operations, locate steel reinforcing bars and electrical conduits embedded in the concrete slabs by X-ray or other approved method to prevent cutting of steel bars and conduits. Maximum size of opening shall be 5" in diameter, unless otherwise noted on drawings or permitted in structural drawings.

F. Seal all penetrations at fire rated construction with approved fire sealing system.

G. Seal all penetrations through the roof and slab on grade with approved sealing system.

3.7 CLEANUP

A. Comply with requirements of Division 1 and the following:
   1. Remove tools, scaffolding, surplus materials, barricades, temporary walks, debris and rubbish from the project promptly upon completion of that portion of the work of each section. Leave the area of operations completely clean and free of these items.
   2. During construction; cap all electrical conduits in approved manner to insure protection against entrance of foreign substances.
   3. Disconnect, clean and reconnect wherever necessary to locate and remove obstructions from any system stopped by any foreign matter after being placed in operation. Repair or replace any work damaged in removing obstructions at no additional cost to the Owner.

3.8 ACCESS DOORS AND PANELS

A. This Section is responsible for the number of doors required and their accurate placement for access to work of Division 26.
   1. This Section is responsible for arranging equipment so that it is fully accessible and serviceable through ceiling tiles, access doors, panels, etc.
   2. The Section is responsible for any additional access panels beyond what is shown on the contract documents for complete access to all wiring and equipment including equipment which is relocated as a result of the coordination process or equipment that is provided as performance requirements.
   3. This Section shall obtain approval from the Owner's Representative for any added or relocated access doors, panels, etc.

3.9 ELECTRICAL IDENTIFICATION

A. General Installation Requirements:
   1. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.
2. Regulations: Comply with governing regulations and requests of authorities having jurisdiction for the identification of electrical work.

B. Conduit Identification:
   1. General: Where electrical conduit is exposed in spaces with exposed mechanical piping which is identified by a color-coded method, apply color-coded identification on electrical conduit in a manner similar to piping identification.

C. Cable and Conductor Identification:
   1. General: Apply cable and conductor identification to each cable and conductor in each box or enclosure or cabinet where wires of more than one circuit or communication or signal system are present. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar identification for electrical work.

D. Operational Identification and Warnings:
   1. General: Wherever required to ensure safe and efficient operation and maintenance of the electrical systems, and electrically connected mechanical systems and general systems and equipment, including the prevention of misuse of electrical facilities by unauthorized personnel; install self-adhesive plastic signs or equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes.

E. Danger Signs:
   1. General: In addition to installation of danger signs required by governing regulations and authorities having jurisdiction, install danger signs at locations indicated and at locations subsequently identified by installer of electrical work as constituting similar dangers for persons in or about project.

F. Equipment and System Identification Nameplates:
   1. General: Install an engraved plastic laminate nameplate on each major unit or electrical equipment in the building, including central or master unit of each electrical system, unless unit is specified with its own self-explanatory identification or signal system. Provide text with matching terminology and numbering of the contract documents and shop drawings. Provide engraved nameplates for each unit of the following categories of electrical work.
      a. Panelboards, electrical cabinets and enclosures.
      b. Access doors to electrical facilities and wiring.
      c. Motor control centers, motor starters, VFDs, contactors and disconnects.
      d. Transformers.
      e. Fire detection, alarm and communications systems panels.
      f. Lighting control panels.
      g. Terminal cabinets and pull boxes.
   2. Install signs at locations indicated or where not otherwise indicated, at location for best viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrate.

G. Wiring Device Circuit Identification Nameplates
   1. General: Provide all switch and duplex receptacle cover plates with panel and circuit identification clear tape labels.

H. Junction and outlet boxes: Mark the covers of junction and outlet boxes of the panel and circuit numbers inside the boxes with black felt pen.
3.10 GROUNDING

A. System Neutral Ground
1. Ground the neutral conductor of each transformer to limit the maximum potential above ground due to normal operating voltage and limit the voltage level due to abnormal conditions.

B. Equipment Ground
1. Ground non-current carrying metal parts of electrical equipment enclosures, frames, conductor raceways to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together. Install a ground conductor in each raceway. Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per NEC 250-95, unless otherwise shown on drawings.
2. Grounding conductors shall be identified with green insulation. Where green insulation is not available on larger wire sizes, black insulation shall be used and suitably identified with green tape at each junction box or device enclosure.
3. Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity.
4. Feeders and motor branch circuits: Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knockouts.
5. Motors shall be connected to equipment ground conductor with a conduit grounding bushing at the motor terminal box and with a bolted solderless lug connection on the metal frame from the conduit grounding bushing.
6. All polarized receptacles, lighting fixtures, and equipment enclosures shall be grounded with an identified (green color) insulated conductor, no smaller than No. 12, connected to the branch circuit panelboard ground bus terminal strip. The ground bus terminal strip in each panelboard enclosure shall be isolated and independent of the system neutral terminal strip, but not isolated from the panelboard enclosure. Ground the outlet boxes, light fixture housing and equipment enclosures to the equipment grounding conductors. Splice the equipment grounding conductor and make the connection to the outlet boxes, light fixtures, receptacles and equipment enclosures.

C. General Grounding
1. All ground connections that are buried or in inaccessible locations shall be welded or silver soldered. The process shall join all strands and shall not in any way cause the parts to be damaged or weakened.
2. The welding process shall be exothermic fusion type which will make a connection that will not corrode or loosen. The completed connection or joint shall be equal or larger in size than the conductors joined and shall have the same current-carrying capacity as the largest conductor. The ground connection shall be painted with a bit-mastic (corrosion retardant) paint.
3. Ground connections in accessible locations shall be bolted, except that any required connections to steel building columns in either accessible or inaccessible locations shall be exothermically fusion-welded.
4. All ground connection surfaces shall be cleaned and all grease and foreign contamination removed. Clad material shall not be penetrated in the cleaning process. Connections shall be made between like metals where possible. Where dissimilar metals are welded, brazed, or clamped, the weld kit manufacturer's instructions shall be followed.

3.11 TESTS

A. General:
1. In addition to complying with Section 260126, comply with testing requirements as specified herein, governing authorities having jurisdiction and test requirement of other...
sections of this Division.

2. Obtain approval for test procedures. The Owner and authority having jurisdiction shall be notified a minimum of seventy-two (72) hours in advance of tests, unless otherwise noted. Any test conducted without notification shall be subject to retest at the discretion of the Owner without additional cost to Owner.

3. Tests shall be performed and systems approved, prior to painting, covering, insulating, furring, or concealing piping, as applicable. Prior to test, protect or remove all control devices and other items which are not designed to stand parameters used in test.

4. Provide labor, materials, instruments and power required for testing under respective sections for work under that section.

5. Adjust, repair, or replace defective work and repeat tests until systems and component parts receive approval of Owner and regulating authorities. Damages resulting from tests to electrical systems or to work of other trades shall be repaired and restored to their original condition as directed by Owner at no additional cost to the Owner.

6. Test all systems as specified under various applicable sections. Duration of tests shall be determined by authority having jurisdiction, where applicable, and in no case less than the time specified.

7. Provide all required testing, and repeated testing until the authority having jurisdiction and Owner is satisfied that work is in accordance with Contract Documents.

8. Adjust, repair, or replace at no additional cost to the Owner, any portion of work which fails to meet the specified requirements as noted on the tests.

9. Make all final tests in the presence of the authorities having jurisdiction.

10. Furnish copies of tests reports and certificates of acceptance, signed by the authorities having jurisdiction, to Owner before submitting for final payment; such payments will not be processed until these submittals have been made.

3.12 ACCEPTANCE DEMONSTRATION

A. Upon completion of the work, at a time to be designated by the Owner's Representative, the Contractor shall demonstrate the operation of the electrical installation, including any and all special items installed by him or installed under his supervision, to Owner's Representative and Owner's satisfaction.

B. Owner's Representative may require operation of parts or all of respective installations prior to final acceptance.

C. Operation of installation shall not be construed as acceptance of work.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Conduits and other raceways.
B. Wires and cables.
C. Outlet boxes, junction boxes and pullboxes.
D. Hangers and supports.
E. Equipment mounting and support hardware.
F. Wiring devices and coverplates.
G. Waterproofing assemblies.
H. Sealants.
I. Miscellaneous materials not specifically mentioned in other sections of Division 26, but necessary or required for equipment or system operation of function, and the labor to install them.

1.2 REFERENCES

A. NEMA KSI: Enclosed Switches.
B. NEMA WD1: Wiring Devices.
C. NEMA WD5: Specific Purpose Wiring Devices.
D. UL 1: Flexible Metal Conduit.
E. UL 5: Surface Metal Electrical Raceway and Fittings.
F. UL 6: Rigid Steel Conduit, Zinc Coated.
G. UL 44: Rubber-Insulated Wire and Cables.
H. UL 50: Electrical Cabinets and Boxes.
I. UL 83: Thermoplastic-Insulated Wires.
J. UL 486: Wire Connectors and Soldering Lugs.
K. UL 493: Thermoplastic-Insulated Underground Feeder and Branch Circuit Cables.
L. UL 514: Electrical Outlet Boxes and Fittings for Non-Hazardous Location.
M. UL 797:  Electrical Metallic Tubing.

N. UL 1242: Intermediate Metal Conduit.


1.3 SUBMITTALS

A. Submit in accordance with the requirements of Division 1 and Section 260500.

B. Materials list for all materials with manufacturer, style, and series or model identified.

C. Manufacturer's descriptive literature and samples if requested by the Owner.

D. Shop Drawings:
1. Prepare shop drawings for any areas in which installation will differ from the contract documents, including re-routing of raceway and relocation of equipment, coordination with other Divisions, including structural, mechanical, and architectural.
2. Shop drawings shall show means of bracing all conduits and equipment to comply with seismic requirements of Section 260529.
3. Shop drawings shall show exact routing of raceways, cable trays, distances between conduits in or beneath slabs, means of suspension and bracing; including any required panel schedule changes; and new locations of equipment to be installed.
4. All shop drawings shall be submitted to the Owner for approval before installation.
5. Surface metal raceway locations, dimensions, outlet type and location, and circuiting.
6. Prior to installation, prepare and submit shop drawings of major and feeder runs of conduits 1-1/2 inch and larger size, exposed and concealed locations, and under the building floor slab on grade locations.

E. Submittals for Vibration Isolation:
1. The submittal for electrical equipment vibration isolation shall include information for the isolation mounts, as follows:
   a. A complete description of products to be supplied, including product data, dimensions, specifications, and installation instructions.
   b. Detailed selection data for each vibration isolator, supporting equipment, including:
      1) The equipment identification mark;
      2) The isolator type; and
      3) The actual load.

F. Submission of samples may be requested for each type of vibration isolation device. After approval, samples will be returned for installation at the job. All costs associated with samples shall be borne by the Contractor.

PART 2 - PRODUCTS

2.1 GENERAL

A. Capacity and Performance
1. Provide necessary calculations for correct sizing of equipment and materials for the specific application.
2.2 CONDUITS AND OTHER RACEWAYS

A. Manufacturers: National Electric Products Corp., Republic Steel Corp., United States Steel, Western Tube and Conduit Corp, or equal.

B. Rigid steel conduit shall conform to U.L. 6. Zinc coating shall be applied inside and out by hot-dip galvanizing after threading. Minimum size shall be 1/2" unless specifically noted, conduit homeruns shall be 3/4" minimum size. Heavy wall or intermediate wall conduit installed per Code or as specified.

C. Rigid Steel Conduit Fittings: Locknuts shall be extra heavy electro-galvanized steel for sizes through 2". Locknuts larger than 2" shall be electro-galvanized malleable iron. Bushings shall be electro-galvanized malleable iron with insulating collar. Grounding bushings shall be locking type and shall be provided with feed through compression lug. Liquid-tight hubs with insulated throats shall be provided for all connections to sheet steel enclosures. Rigid conduit shall be used with threaded fittings only.

D. Electrical Metallic Tubing (EMT): Shall be electro-galvanized and comply with U.L. 797. Minimum size shall be ¾” inside diameter, except conduit used to connect to one light fixture shall be 1/2” minimum size.

E. Flexible Metal Conduit: Shall be formed spirally wound galvanized steel strip with successive convolutions securely interlocked, conforming to U.L. Maximum allowed length shall be six feet. Minimum size shall be 1/2” inside diameter.

F. Liquid-tight Flexible Metal Conduit: Shall be formed from spirally wound galvanized steel strip with successive convolutions securely interlocked, jacketed with liquid-tight plastic cover. Minimum size shall be 1/2” inside diameter; maximum allowed length shall be six feet, unless otherwise noted.

G. Intermediate Metal Conduit (IMC) shall be listed by U.L. and shall bear their listing mark.

H. Fittings for outdoor work shall be of cast, shall have threaded hubs, and insulated throats.

I. Fittings for rigid metallic conduit and electrical metallic tubing shall conform to U.L. standard 514 for nonhazardous areas only. Rigid conduit shall be used with threaded fittings only. Split couplings are not acceptable. All box connectors shall be provided with nylon insulation for EMT, and bonding and grounding type for rigid conduits. Connectors shall have nylon insulated throats.

J. Fittings for electrical metallic tubing (EMT) for sizes 1/2" through 4" shall be compression type which shall provide pull-on force resistance and electrical continuity as required by U.L. 514. Indenting fittings shall not be used. Connectors shall have nylon insulated throats.

K. Fittings for flexible metal conduit shall conform to U.L. standard 514 and shall be cadmium or zinc-coated. Connectors shall have nylon insulated throats.

L. Cast metal conduit bodies shall conform to U.L. Standard 514 and shall be cadmium or zinc-coated if of ferrous metal. Outlets shall be gasketed and provided with cap over each opening. The cap shall be permanently attached to the coverplate by a short length of bead chain or shall be provided with a spring-hinged flap. Conduit bodies with PVC coating shall have a minimum 40 mil thickness of PVC coating.

M. Junction boxes and covers shall conform to U.L. Standard 514 for non-hazardous areas.

N. Non-Metallic conduit shall be Schedule 40, high impact polyvinyl chloride. Fittings used with PVC
conduit shall be PVC solvent weld type. Manufacturers: Carlon, Triangle, Johns-Manville, or equal.


P. Conduit sleeves (for non-waterproof locations):
   1. Steel sleeve schedule 40 for above slabs on grade.

2.3 WIRES AND CABLES

A. All conductors shall be copper, conforming or exceeding applicable ICEA standards.

B. For power distribution systems 600V or less, insulation type:
   1. Stranded copper conductor.
   2. Wire Size #12 AWG through #8 AWG:
      a. Type TW or THHN in dry location.
      b. Type THW or THHN in wet locations.
   3. Wire Size #6 AWG and larger: Type XHHW in dry or wet locations.
   4. Wire within conduits in damp locations or in concrete in contact with the ground: RHW insulation.
   5. Where required by equipment nameplate, use high temperature rated conductors.
   6. Grounding wire: THWN.
   7. Ampacity rating for wires: Per NEC Table 310-16 at 75°C temperature column or column of lug temperature rating whichever is lower.

C. Conductors for general branch circuits: Copper conductor, #12 AWG minimum, except as otherwise noted on the drawings.

D. Wire and cable for communication, data, security and fire alarm systems shall be as specified under the separate headings for these systems.

E. All cables used in cable tray shall be U.L. listed for use in cable trays, in accordance with CEC Article 318-3.

F. Where required by code, cables shall be approved for plenum installation, when installed within ceiling space used as air handling space.

G. Manufacturers: Anaconda, Okonite, Cyprus-Rome, Triangle, or equal.

2.4 WIRE JOINTS, CONNECTIONS AND SUPPORTS

A. Joints of conductors rated up to 600 volts shall be made mechanically and electrically secured by using one of the following methods:
   1. Connections to Circuit Breakers and Switches:
      a. No. 12 wire: Formed around binding post or screw.
      b. No. 10 and No. 8 wire: Locking tongue lug. Manufacturers: Buchanan Termend, Thomas and Betts, or equal.
      c. No. 6 wire and larger: Round flange solderless lug. Manufacturers: Burndy Quiklug Type QDA, Penn Union, or equal.
   2. Connections to Fixtures: Make circuit wiring connections to fixture wire with insulated electrical spring connectors. Threaded-type wire nuts, porcelain or bakelite are not acceptable.
   3. Wire Joints:
      a. No. 6 and larger. Manufacturers: Burndy Type QPR, Penn Union, or equal.
b. No. 8 and smaller: Pigtail splices as described below, or made with insulated
electrical spring connectors. Manufacturers: 3M Scotchlok Insulated Electrical
Spring Connectors, Thomas and Betts, and 3M Scotchcast 82 Series Resin
Splicing Kits, Thomas and Betts, or equal.
1) Where underground and high moisture area connections are required to
be insulated, use approved moisture-proof epoxy resin splicing kits.
2) Insulate uninsulated solderless connections for wires, the same as
pigtail splices.

B. Supports for Vertical Wiring: OZ Gedney type R, Appleton, or equal cable support plugs.

2.5 OUTLET BOXES, JUNCTION AND PULL BOXES

A. Outlet boxes: Hot-dipped galvanized, 4" square by 2-1/8" deep, minimum, for flush mounted
devices and lighting fixtures. Cast type with gasketed covers for outdoor or wet locations. Extra-
large and extra deep sizes as required by device or equipment and code, or indicated on
drawings.

B. Junction and Pull Boxes: Use outlet boxes as junction boxes wherever possible. Larger junction
and pull boxes located indoors shall be fabricated from galvanized sheet steel, NEMA-1, with
screw-on covers, and gray baked enamel finish. Where located outdoors or in wet locations,
shall be NEMA 3R.

2.6 CONDUITS SUPPORT SYSTEM

A. Comply with the requirements of Section 260529.

B. For individual conduit run on the surface of the building structure:
   1. Use 1-hole conduit clamps for conduit 1-1/2" and smaller.
      a. Rigid and IMC conduits. Manufacturers: O-Z Gedney Cat. No. 14-
         50S/75S/100S/125S/150S Series, Appleton, Unistrut, or equal.
      b. EMT conduits. Manufacturers: O-Z Gedney Cat. No. 15-
         50S/75S/100S/125S/150S Series, Appleton, Unistrut, or equal.
   2. Use 2 hole style for conduits 2" and larger. Manufacturers: Appleton, O.Z. Gedney,
      Unistrut, or equal.

C. For multiple conduit runs (two or more conduits) on the surface of the building:
   1. Fasten to U-channel strut system Unistrut P1000, B-Line Strut, or equal with conduit
      clamps. Fasten channel strut system Unistrut P1000, B-Line Strut, or equal to the
      building.

D. For individual conduit run not on the surface of the building, it shall be pendant mounted and
   installed as follows:
   1. Conduit size 1-1/2" and smaller: Use 1/4" diameter threaded hanger rod with O-Z
      Gedney Cat, or equal. No. H-XXBS series conduit hangers Unistrut, B-Line, at 8'-0" on
      centers. Grainger, or MSC, or equal.
   2. Conduit size 2" and larger: Use 1/4" diameter threaded hanger rods with Unistrut Cat.
      No. J12XX Series conduit hangers, Unistrut, B-Line, at 8'-0" on centers. Grainger, or
      MSC, or equal.
   3. Seismically braced per the requirements of Section 260529.

E. For multiple conduit runs not on the surface of the building, it shall be pendant mounted and
   provided with trapeze type conduit support system. Supports to be installed at maximum spacing
   of 8'-0". Trapeze support shall consist of U-channel strut system, hanger rods, conduit clamps
   and fittings and fastening devices. Multiple conduit runs are runs of two or more conduits,
regardless of trade sizes. Hanger rods shall be threaded and \(1/4''\) diameter minimum size. Comply with CBC requirements and the requirements of Section 260529.

F. Provide necessary clamps and fastening hardware for fastening conduit trapezes per the requirements of Section 260500 and the CBC.

G. Rod hangers, trapeze and bracing hardware shall be as manufactured by Unistrut, Superstrut, Powerstrut, or equal. Utilize approved suspension and seismic bracing system of the manufacturer selected. Comply with CBC requirements and the requirements of Section 260529.

H. All rods, clamps, etc., suspended from concrete decks, concrete slabs on metal decks, etc., shall be supported by Hilti Kwik Bolt III, Phillips red-head drilled in wedge type or expansion anchors, or equal, and shall be installed in accordance with Division 3 and manufacturer's instructions. All other supports shall be from structural members, utilizing beam clamps that shall be compatible with structural members.

I. Within metal studs of gypsum or plaster walls:
   1. Caddy No. 781, Raco, or equal.
   2. Black iron wires.

2.7 SAFETY DISCONNECT SWITCHES

A. Heavy duty type, 240V or 600V, HP rated for motors, standard NEMA 1 enclosure indoor dry locations, and NEMA 3R outdoor locations, fused or non-fused as required. Switches shall be three pole single throw unless otherwise indicated on drawings to be four pole double throw (4P DT). Suitable for service entrance where indicated on drawings. Manufacturers: Cutler-Hammer, Square D, Siemens, General Electric, or equal.

B. Switch Interior: Dead-front construction with hinged arc suppresser and switch blades which are visible in the "OFF" position and with door open.

C. Switch Mechanism: Quick-make and quick-break operating handle and mechanism with a dual cover interlock to prevent unauthorized opening of the switch door in the "ON" position or closing the switch mechanism while the door is open. "ON" position shall be in the upward direction for vertical mounted switches.

D. Fuses for 600 amperes or less: Current limiting, dual element, U.L. Class RK5.

E. Provide disconnect switch at mechanical motor fan controller if integral disconnect switch is not provided with the controller. Coordinate with mechanical trades.

2.8 EQUIPMENT MOUNTING AND SUPPORT HARDWARE

A. Steel channels, bolts, washers, etc., used for mounting or support of electrical equipment shall be galvanized type, except where located on roof, shall be stainless steel.

2.9 WIRING DEVICES

A. All wiring devices shall conform to U.L. 20 and NEMA WDI for current and voltage indicated, heavy duty specification grade. Manufacturers: Hubbell, Arrow Hart, Pass and Seymour, or equal. Numbers listed are those of Hubbell, unless otherwise noted:

B. Switches:
   1. Switches mounted indoors shall be rated at 20 amps, 120-277 volts AC and shall have binding screws for side wiring. Switches shall be Hubbell catalog numbers 1221-WHI for
single pole, 1222-WHI for double pole, 1223-WHI for three-way, and 1224-WHI for four-way.

2. Switches mounted outdoors or within six (6) feet of sinks shall have weatherproof neoprene gray color covers equal to Arrow Hart Cat. No. 2881, OR Hubbell, Pass and Seymour.

3. Color shall be white, unless otherwise noted. Verify color with the Owner prior to submission of submittals.

C. Receptacles (Hubbell numbers indicated):
   1. 20 amperes, 125 volts, 2-pole, 3-wire grounding, duplex receptacle, 20 amperes, 125 volts, 2-pole, 3-wire grounding, duplex receptacle, No. 5362-WHI. (NEMA 5-20R).
   2. 20A, 2-pole, 3-wire, GFI, 125V, duplex ground fault receptacle, No. GF5362-WHI. (NEMA 5-20R).
   3. Receptacles shall be white, unless otherwise indicated. Verify color with Architect prior to submission of submittals.
   4. Other receptacles designated by NEMA number on drawings shall be as manufactured by Hubbell, Arrow Hart, Pass and Seymour, or equal.
   5. Pedestal receptacles: Anodized aluminum, two gang bench top mounted box with two NEMA 5-20R receptacles, brushed stainless steel cover plates, baseplate and bottom housing. Legrand Wiremold LBP2 series, or equal.

D. Isolated ground type: 20A, 125V, 2-pole, 3-wire, isolated ground, orange color. #IG5362

E. Controlled duplex receptacle: 20A, 125V, 2-pole, 3-wire grounding, engraved to indicate “controlled”. #BR20C2-WHI

F. Half-controlled duplex receptacle: 20A, 125V, 2-pole, 3-wire grounding, engraved to indicate “controlled” on one receptacle. #BR20C1-WHI

G. Floor Boxes, Type FC7, power only: Legrand omni-box, or equal, two gang stamped steel box, brass carpet flange and brass rectangular cover plate. #880S2 box, #817B flange and #828DPGFITC cover.

H. Motor Rated Switches: Fractional horsepower motors with integral overload protection shall be equipped with appropriately sized AC manual motor starting switches without overload protection. Switches with overload protection shall be provided for all other fractional horsepower motors. Manufacturers: Cutler Hammer, Square D, Siemens, General Electric, or equal.

2.10 COVERPLATES

A. Manufacturers: Hubbell, Leviton, Arrow-Hart, Bryant, Pass & Seymour or equal.

B. Light switches and lighting control devices: White smooth nylon or thermoplastic.

C. Receptacles: Brushed stainless steel.

D. Provide matching ganged plates for devices mounted side by side.

E. Coverplates for manual starters to have "ON-TRIP-OFF" engraved adjacent to handle.

F. Exterior of Building: Cast metal, vertical mounting for duplex receptacles and switches, hinged type, weatherproof while in-use with 1/8" thick gasketing, lockable. Intermatic WP series, Hubbel, or equal.

G. Provide blank coverplates for all unused outlet boxes, including but not limited to:
1. Lighting and power.
2. Spare or empty outlet boxes.

2.11 VIBRATION ISOLATION

A. General: Furnish and install vibration control devices, materials, and related items. Perform all work as specified herein to provide complete vibration isolation systems in proper working order. Comply with the requirements of Section 230548 – Vibration Controls for HVAC Piping and Equipment.

B. Material and Equipment
1. All vibration isolation mounts shall be supplied by one of the manufacturers listed herein.

C. Quality Assurance:
1. Coordinate the size, location, and special requirements of vibration isolation equipment and systems with other trades. Coordinate plan dimensions with size of housekeeping pads.
2. Provide vibration isolators of the appropriate sizes and proper loading to meet the specified requirements.
3. Supply and install any incidental materials needed to meet the requirements stated herein, even if not expressly specified or shown on the drawings, without claim for additional payment.
4. Verify correctness of equipment model numbers and conformance of each component with manufacturer's specifications.
5. Should any electrical equipment cause excessive noise or vibration, the Contractor shall be responsible for remedial work required to reduce noise and vibration levels. Excessive is defined as exceeding the manufacturer's specifications for the unit in question.
6. Upon completion of the work, the Owner shall inspect the installation and shall inform the Contractor of any further work that must be completed. Make all adjustments as directed by the Owner that result from the final inspection. This work shall be done before vibration isolation systems are accepted.

D. Products
1. Vibration Isolation Mount Types
   a. Unit DNP (Double Neoprene Pad)
      1) Neoprene pad isolators shall be formed by two layers of 1/4" to 5/16" thick ribbed or waffled neoprene, separated by a stainless steel or aluminum plate. These layers shall be permanently adhered together. Neoprene shall be 40 to 50 durometer. The pads shall be sized so that they will be loaded within the manufacturer's recommended range. A steel top plate equal to the size of the pad shall be provided to transfer the weight of the supported unit to the pads and to distribute the load evenly over the surface of the pads.
      2) Manufacturers: Unit DNP isolators shall be formed from one of the following products:
         a) Type NR Amber/Booth, Mason Industries, or equal.
         b) Type Korpad Korfund Dynamics, Mason Industries, or equal.
         c) Type WSW Mason Industries, Korfund Dynamics, or equal.
         d) Type NPS Peabody Noise Control, Mason Industries, or equal.
         e) Series Shear Flex Vibration Mountings & Control, Mason Industries, or equal.

2. Flexible Electrical Connections
   a. Provide liquid-tight flexible conduit connections to vibrating equipment or machines such as motors, transformers, etc. Provide minimum 50% more
conduit slacks.

2.12 WATERPROOFING SLEEVE ASSEMBLIES

A. Waterproofing sleeve assemblies for floor and wall penetrations: Thunderline Corp. Link-Seal or equal, complete with coated steel pipe wall sleeve with standard weight wall, anchor, and water stop plate. Seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to fill the annular space between pipe and sleeve, complete with pressure plates and cadmium plated nuts and bolts.

PART 3 - EXECUTION

3.1 GENERAL

A. Electrical system layouts indicated on the drawings are generally diagrammatic, but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of raceway, cable trays, wiring, locations of equipment, and outlets by the structure and the equipment served. Take all dimensions from Architectural drawings. Coordinate work with architectural, civil, landscape, structural, and mechanical drawings.

B. Avoid cutting and boring holes through structure or structural members. Obtain prior approval of the State and conform to all structural requirements when cutting or boring the structure is necessary and permitted.

C. Furnish and install all necessary hardware, hangers, blocking, brackets, bracing, runners, etc., required for equipment specified under this Section.

D. Provide necessary backing required to ensure rigid mounting of outlet boxes.

E. Provide sound proofed seals for all conduit penetration through sound rated walls and floor. Provide sound proofed seals for all junction boxes located at sound rated walls. See Architectural drawings for location of all sound rated wall and floor. See drawings for requirements.

3.2 WIRING METHOD

A. Install all wiring in raceway.

B. Sizes for conduits, unless specifically shown, shall be determined from Table 3A, Chapter 9 of the latest National Electric Code for all 600V rated conductors, based on type THW insulation.

C. Minimum conduit size shall be 3/4” inside diameter and 1” C for underground installation.

D. Raceway and box sizes for telephone, signal, television and data systems shall be as indicated in Drawings.

E. All raceways shall be rigid conduit unless otherwise indicated or permitted by this Section. All raceway material delivered to the jobsite shall bear the U.L. label and shall be stored so as to be protected from physical damage and weather elements.

F. EMT may be used when concealed in walls or ceiling, within electrical, telephone, and mechanical rooms, and in exposed indoor locations not subject to damage.

G. Plastic conduit may be used underground except as otherwise noted, run beneath warning slab or slab on grade.
Conduits, fittings, conduit bodies, and outlet boxes.

Use flexible conduits in the following applications:
1. At transformers and other vibrating equipment.
2. Connections between light fixtures and junction box at lay-in grid ceilings.

Use liquid tight flexible conduits with threaded waterproof fitting in the following applications:
1. Exterior locations.
2. Wet locations.
3. Motors (in dry or wet locations).
4. Building expansion joints.

Use rigid steel conduit in concrete slabs and walls; minimum size 1”. All conduit installed in concrete must have structural engineer's approval of size, number, and location prior to installation.

3.3 INSTALLATION OF CONDUITS

Conceal conduits in walls, ceilings, and slabs where possible; otherwise run exposed parallel or at right angles to center lines of columns and beams. Exposed conduits are permitted only within the electrical and telephone rooms, and mechanical rooms. Provide required coring and notching to pass through joists, walls and floors.

Conduits in mechanical, electrical and telephone rooms may be installed exposed. In all electrical rooms mechanical rooms, and telecom rooms, no conduits shall be installed horizontally on walls, which may block future equipment space.

Conduits not cast in concrete shall be supported by galvanized wall brackets, ceiling trapeze, malleable straps or "mineralac" clamps. Conduit shall be supported at intervals of not more than ten (10) feet. Conduit installed within metal studs shall be provided and secured to brackets and secured to metal studs with fasteners or black iron wires that go around conduits twice and are twisted with a minimum of 4 turns.

Provide conduit sleeves and chases wherever conduits pass through floors and concrete foundations. Set in forms before concrete is poured. All penetrations of roofs and exterior walls shall be flashed and counter-flashed to preserve waterproof integrity of the building. Comply with details on architectural drawing for conduit roof penetrations. Material and techniques used shall conform to roof or wall waterproofing specifications. All exterior wall and slab penetrations shall be made watertight. Use PVC schedule 40 for underground installation. All 12KV services conduits shall be concrete encased.

Flexible conduits and expansion fittings shall be installed at all expansion joints in the building. Use flexible conduits for indoors and expansion fittings for outdoors. Refer to structural and architectural drawings for extent and criteria of building movement. If none shown, use two times the seismic joint dimension plus 50% of joint dimension for the length of fittings or flexible conduits movement.

Conduits, wireway or cable tray passing through fire rated walls and floors shall be firestopped and fireproofed to maintain the integrity of the fire rated wall or floor. Conduits shall not penetrate fire rated shafts and stair walls.

Seal all conduits passing through mechanical plenums, noise control walls, and similar locations. Seal the gaps around conduits.

Waterproofing Assemblies: Conduits penetrating exterior foundation below grade shall be
provided with waterproofing assemblies. Seals shall be cast in wall with sleeve, with pressure ring inside of structure.

I. All underground conduits and ducts 2" and larger shall be proven clear by pulling through a mandrel 1/4" smaller than the conduit inside diameter.

J. PVC conduits shall not be installed in slabs or concrete walls above finished grade or inside the building and outdoors exposed.

K. Steel wire hangers, suspended from structure or fastened to the structural columns or beams are not acceptable installation methods for suspended or pendant conduits.

L. Provide empty conduits with nylon insulated throats and pull strings.

M. Underground conduits from the site entering the building shall be routed and installed in accordance with the requirements of structural drawings and specifications.

N. Conduits shall not penetrate fire rated shafts and stair walls unless that conduits serve the shafts and stair walls.

O. Cap all spare conduits.

P. Conduits shall not run on roof decks. Run conduits at roof areas surface mounted to structural steel members and equipment pads.

Q. Seal all underground conduits at pull boxes after conductors are installed.

3.4 INSTALLATION OF WIRES

A. Pull no wire into any portion of the conduit system until all construction work which might damage the wire has been completed.

B. Install all wires continuous from outlet to outlet or terminal to terminal. Splices in cables when required shall be made in approved fittings; handholes, pull boxes or junction boxes. Make branch circuit splices in outlet boxes with 10 inches of correctly color-coded tails left in the box.

C. Splices in wires and cables shall be made utilizing materials and methods as specified herein.

D. Install 1/8" diameter pull line in all empty conduits except where noted and specified otherwise. Manufacturers: Tubbs Cordage Company yellow "polyline", Jet Line, or equal.

E. Provide wire markers on all conductors in each junction or pull box, and at each terminal point. Marker shall include panel and circuit number for each wire, and line designation number for equipment wiring. Manufacturers: Brady, Panduit, or equal.

F. Provide legible permanent markings on covers of all junction boxes and pull boxes within ceiling spaces to indicate panel and circuit numbers within box.

G. Branch Circuit Homeruns: When branch circuit homeruns exceed the length indicated below, the Contractor shall install minimum wire sizes as follows:
   1. For homeruns exceeding 100 feet up to 180 feet maximum of 20 ampere capacity circuits, use minimum #10 AWG wires.
   2. For homeruns exceeding 180 feet up to 250 feet maximum of 20 ampere capacity circuits, use minimum #8 AWG wires.
   3. For homeruns exceeding 250 feet of 20 ampere capacity circuits, size wire as required
to avoid exceeding 3% voltage drop from the panel to farthest outlet or load.

4. Unless otherwise specified, size conduit homeruns accordingly as permitted by NEC Table 9.

5. The preceding wire sizes noted shall start from the panel to the first outlet.

6. This requirement shall govern over what is shown on the plans.

H. Branch Circuit Wiring:
1. Quantity of wires for receptacle and lighting branch circuit wiring shall be in accordance with circuiting and switching or control arrangement, and as herein specified.
   a. 4 wires plus ground: For three 20A, (or 15A), 1-pole, 120 volt (or 277 volt) circuits.
   b. 3 wires plus ground: for two 20A, (or 15A), 1-pole, 120 volt (or 277 volt) circuits.
   c. 2 wires plus ground: for one 20A, (or 15A), 1-pole, 120 volt (or 277 volt) circuit.
   d. Per Single Pole Switch: Minimum 2 wires plus ground wire.
   e. Two Light Switches from Same Circuit: Minimum 3 wires plus ground wire.
   f. Per 3-way Light Switch: Minimum 3 wires plus ground wire.
   g. Two 3-way Light Switches for Same Circuit: Minimum 5 wires plus ground wire.
   h. Green insulated ground wire shall be provided for all circuits.

2. Homeruns and branch circuiting unless otherwise shown on the plans, electrical drawings, and lighting plans.

I. Supports for Vertical Wiring: Provide in vertical conduit runs at a maximum spacing of 30 feet for the support of the conductors.

3.5 WIRE COLOR CODE

A. Color code and wire tag all conductors. Wires shall have integral color code insulation.

B. Color code insulation of wires as follows:

<table>
<thead>
<tr>
<th>Conductors</th>
<th>120/208 Volts</th>
<th>277/480 Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A</td>
<td>Black</td>
<td>Brown</td>
</tr>
<tr>
<td>Phase B</td>
<td>Red</td>
<td>Orange</td>
</tr>
<tr>
<td>Phase C</td>
<td>Blue</td>
<td>Yellow</td>
</tr>
<tr>
<td>Neutral</td>
<td>White</td>
<td>White or gray</td>
</tr>
<tr>
<td>Ground</td>
<td>Green</td>
<td>Green</td>
</tr>
</tbody>
</table>

C. Color coding of wires used for signal and communication systems are specified under the respective sections for these systems.

D. Motor Circuits:
1. Motor Power Conductors: In accordance with color coding specified in Part 3.5B.
2. Motor Control Conductors
   For 1/C Wires
   Wire 1 - Red
   Wire 2 - White
   Wire 3 - Yellow
   Wire 4 - Blue
   Wire 5 - Orange
   Wire 6 - Brown
   Wire 7 - Purple
3. For Multiconductor or Composite Cables: All control wires shall be of a neutral color
3.6 CONNECTIONS TO EQUIPMENT

A. Furnish and install required power supply conduit and wiring to all equipment.

B. Install all rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.

C. Mechanical, Plumbing, Architectural, and Other Contractor-Furnished and Owner-Furnished Equipment:
   1. All required power conduit, wiring and connections are included under this Section of the work. Control, sensing and alarm devices will be furnished under the respective section of the specification supplying the equipment unless noted otherwise. Where these are located in pipes, ducts, vessels, tanks, etc., they shall be mounted in place by the Contractor furnishing the devices. All others shall be mounted under this Section of the work.

D. Control panels for packaged equipment shall be furnished under the respective Section of the specification supplying the equipment unless otherwise noted. Installation and connection of the control panels are under this Section of the work.

E. Starters for motors associated with mechanical (non-packaged) equipment not specified under other sections of the specifications shall be furnished and installed under this section.

3.7 MOUNTING HEIGHTS

A. Refer to architectural drawings and electrical legend sheet for mounting heights of devices and equipment.

3.8 DEVICES, WALL SWITCHES, RECEPTACLES, AND DISCONNECT SWITCHES

A. The location of all outlets, devices, wall switches, receptacles, and disconnect switches shown on the drawings is approximate, except for those specifically dimensioned. The exact location and height of outlets not shown on Architectural Drawings shall be coordinated with applicable furniture plans, and if required will be determined by the Owner Representative at the time of installation. Cooperate with other trades to avoid conflict between the location of outlets, ventilating ducts, plumbing pipes and fixtures, furniture installations, etc. Outlet boxes mounted outside the building or at exterior locations shall be waterproof cast type.

B. All boxes shall be independently secured and shall not rely on the conduit system to hold them in place.

C. All outlet boxes installed in plastered walls shall be equipped with plaster rings, except where otherwise specified.

D. Pull boxes and junction boxes mounted outdoors shall be weatherproof and galvanized. Pull boxes and junction boxes mounted indoors may be galvanized or primed and painted.

E. Outlet boxes, pull boxes and junction boxes cast in concrete shall be galvanized.

F. Outlet boxes used to support lighting fixtures shall be securely attached to supports suitable for carrying the weight of the fixtures, and shall have fixture studs. Lighting fixtures shall not be supported by box covers.
G. Outlet boxes mounted on opposite sides of the same wall shall have not less than 12" horizontal separation on non-rated walls and not less than 24" horizontal separation on fire rated walls. If 24" separation cannot be maintained, provide UL listed fire resistant 2-hour rated moldable putty pads over the back and sides of outlet or junction boxes to maintain fire ratings of wall. Manufacturers: Putty pads shall be 3M, Nelson, or equal.

H. Pull-boxes shall be provided when conduit installations have four 90 degree angle bends or the equivalent. Pull-boxes shall be of size in accordance with Code to accommodate splices whether splicing is made or not.

I. Install receptacles with grounding pole at the top.

J. Use jumbo size plates for outlets installed in masonry walls.

K. Where several outlets occur in a room, they shall be located symmetrically.

L. Provide "green" ground pigtail wires, for lighting fixtures and receptacle outlet boxes, bonded to the fixture housing or receptacle outlet box and connected to the ground wire that is installed with branch circuit wires, and grounded to the receptacle ground connection.

M. Outlet boxes for switches and receptacles shall be installed flush mounted in walls with extension device rings. Mount outlet boxes on brackets if required to be centered between partition studs.

N. Outlet boxes for ceiling and floor mounted wiring devices and connections shall be flush mounted.

O. When mounted vertically, the "ON" position of the disconnect switches and enclosed circuit breakers shall be in the upward direction and "OFF" in the downward direction.

P. Mount disconnect switches adjacent to equipment being served on 12 gage strut channels fasten to the floor or roof areas, or on walls within 10 feet and within sight of the equipment served.

Q. Outlets, devices, switches, receptacles, disconnect switches and pull boxes located on the roof shall be in NEMA 3R enclosures and supported on 12 gauge galvanized strut channels fastened to the roof. Provide materials and waterproofing at all roof penetrations and at point of attachment between roof surface and supporting members such as strut channels in accordance with details on architectural drawings and as specified herein. Hot dip galvanize all steel parts after fabrication where used outdoors.

R. Clean boxes of debris and remove marks on switch and receptacle cover plates due to packaging protective covers.

S. Caulk and seal gaps behind cover plates.

3.9 TESTING OF WIRING SYSTEMS

A. All wiring and connections shall be tested in accordance with the requirements of Section 260126.

END OF SECTION
SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. All carpentry, masonry and steel fabrication involved in making stands and supports for equipment installed under this Division, unless specified otherwise.

B. Furnishing and setting of sleeves, rods, inserts, and support and bracing devices for all conduits and equipment installed under this Division.

C. Sizes and locations of all housekeeping pads, piers, and curbs for work of this Division, unless shown or specified otherwise. See architectural and structural drawings for details.

D. Concrete inertia bases where shown or specified for equipment under this Division.

E. Work Described Elsewhere. Specific applications and features or methods unique to a given phase of work may be delineated in other sections.

1.2 SUBMITTALS

A. Submit in accordance with Division 01 and Section 260500.
   1. Structural calculations shall be prepared and stamped by a professional structural engineer licensed in the State of California and shall include, but not be limited to the following:
      a. A repetition of the design criteria contained in the specifications. Conform to requirements of the CBC, unless otherwise noted in the specifications.
      b. Calculations to determine dead, live, and earthquake loads of components and component supports.
      c. Analysis of component anchorage and supports to the main structure.
      d. Cross reference structural calculations to the applicable production and erection shop drawing details.
      e. Show the loads applied to the main building structure in shop drawings or in drawings in the calculations with clear references to locations in the main building structure.
   2. Connections to structure.
   3. Steel for supports.
   4. All fabricated steel and concrete bases.
   5. Pre-engineered seismic bracing systems.
   6. Shop Drawings
      a. Dimensioned plans showing dimensioned sizes and locations of curbs, pads, and inserts.
      b. All fabricated equipment supports and inertia bases.
      c. Support and bracing details, including bracing, for conduits, busduct, cable tray, wireways, and suspended equipment.

1.3 OPERATIONS AND MAINTENANCE

A. Submit under provisions of Division 01 and Section 260500.
   1. Support devices.
2. Anchor devices.
3. Seismic bracing devices, systems, and calculations

1.4 REGULATIONS

A. Seismic Restraint: California Building Code

B. Expansion Anchors: California Building Code

PART 2 - PRODUCTS

2.1 ATTACHMENTS TO STRUCTURE

A. Connection to Concrete Structure: Hilti Kwik-Bolt TZ, ITW Redhead, or equal, wedge type expansion anchors.
   1. Provide 30 stainless steel expansion bolts in Mechanical Level and inside air plenums.
   2. Powder driven fasteners are not allowed.

B. For Suspension from New Formed Concrete Structure: B-Line B3014, Grinnell Figure 282, Superstrut 452, or equal, adjustable concrete insert.

C. For suspension from New Concrete on Metal Deck: B-Line B3019, Superstrut C-475, or equal.

D. For Support on New Concrete: Galvanized steel hook bolts.

E. Welded Connection to Steel Beams: B-Line B3083, Grinnell, Superstrut, or equal, steel welded beam attachment.

F. Clamp Connection to Steel Beams: B-Line, Grinnell, Superstrut, or equal, beam clamp with retaining clip style as required by load.

2.2 SUPPORTS, BRACING, AND ACCESSORIES

A. Miscellaneous Steel: Angles, channels, brackets, rods, clamps, etc., of new materials conforming to ASTM A36.
   1. Hot-dip galvanize all steel parts after fabrication where used outdoors or inside in the mechanical level.
   2. 304 stainless steel for underground pipe support from ground floor structure.

B. Fasteners: All bolts and nuts, except as otherwise specified, shall conform to ASTM Standard Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307. Bolts shall have heavy hexagon heads, and nuts shall be of the hexagon heavy series. Provide bolts of ample size and strength for the purpose intended.
   1. All bolts, washers, nuts, anchor bolts, screws and other hardware used above the fifth floor (outdoors or covered), shall be galvanized, and all galvanized nuts shall have a free running fit.
   2. All ferrous metal components below grade shall be 304 stainless steel.

C. Sheet Metal Screws: Plated, size 10 minimum.

D. Hanger Rods: B-Line, Grinnell, Superstrut, or equal, plated steel rods, threaded, with a minimum safety factor of 5 over the imposed load.
   1. Hot-dip galvanized above roof (outdoors or covered), and electro-galvanized indoors.
E. Conduit Hangers: See Section 260502 – Basic Materials and Methods. Provide rod sizes to meet Section 260502 requirements and the requirements of this section.

2.3 SEISMIC RESTRAINT

A. Comply with the requirements of Section 260548 Vibration and Seismic Controls for Electrical Systems.

PART 3 - EXECUTION

3.1 ATTACHMENTS TO STRUCTURE

A. Concrete Structure:
   1. Locate anchors at least six (6) bolt diameters from any edge condition and at least ten (10) bolt diameters from any other anchor. Provide a minimum of six (6) bolt diameters embedment into concrete, unless otherwise noted on the Drawings.
   2. Limit load at concrete-filled steel deck to no more than 750 pounds per flute per beam bay (approximately 7 feet). Weights exceeding this restriction to be supported from the steel structural elements using engineered spreaders attached to the structural steel.
   3. See Structural Drawings for additional restrictions for locating anchors.
   4. Conform to CBC for drilled-in expansion bolts.

B. Steel Structure: Attach at beam axis. Avoid eccentric loads wherever possible.
   1. Where slack cable bracing is used, the cable size, spacing, and connection are to be as recommended by the slack cable bracing system manufacturer.

C. Rating: Ultimate strength at least five times the imposed load.

D. Coordinate installation so that attachments to structure are made prior to fireproofing. If attachments must be made after fireproofing, then thoroughly clean area of fire proofing before welded or bolted attachments are made and replace fireproofing as necessary.

E. Where point loads, imposed by work of Division 26, are greater than can safely be carried by the deck, provide structural steel spreader beams tied to the building structure. Submit details of all such spreader beams for approval.

3.2 SUPPORTS, BRACING, AND ACCESSORIES

A. This Section is responsible for the proper selection and sizing of all support, bracing, and guiding elements of any single or trapeze systems that include duct, pipe, and/or electrical conduit, wireway, or cable trays, including those in the laboratories. The Contractor shall retain the services of a specialty support system provided to evaluate all loads due to weight, seismic forces, thermal expansion, etc., and perform all calculations and prepare detailed shop drawings for complete support, bracing, guiding, and anchoring systems based on the layouts shown on the Drawings.
   1. All support, bracing, guiding, and anchoring systems used outside and in the mechanical level or outdoors to be galvanized.

B. Set all machines and devices dead level, except where pitch or slope is specified or shown, and securely fasten to the structure unless shown otherwise. Use dry pack cement grout to obtain complete contact between structure and equipment. Provide steel bracing as shown and specified to resist earthquake loads.

C. Concrete Work: Pads, curbs, and piers for equipment furnished under this Division shall be located and sized under this Division and installed by Contractor. Inform Division 3 that all
concrete shall be finished and surface hardened. This Section is responsible that forms, anchors, embeds, embedded channels and bases are properly set in the correct location. Carefully lay out all anchor locations before concrete is poured.

1. Provide housekeeping pads for all equipment provided unless specifically indicated otherwise. Nominal size is 4 inches high unless indicated otherwise.

D. Conduit and Rack, and Bracing:
1. Support Devices: per the requirements of this section and Sections.
2. Provide bracing longitudinally and transversely in accordance with specified guidelines. See Seismic Restraint hereinbefore.
3. Brace conduit trapeze where the cumulative weight of conduits exceeds the weight of a single 2-inch pipe.
4. Install sleeves wherever pipes are run through walls, and floors to allow large enough openings for the passage of the pipe and pipe insulation when required. Sleeves shall be of sufficient size to allow for contraction and expansion of pipe. The space between each pipe and sleeve (or insulation and sleeves) shall be completely closed by packing with code approved mineral fiber materials with a suitable binder or other approved packing material. Sleeves at floors are to extend 2" minimum above structural slab or finished floor whichever applies. Seal all penetrations through all fire rated construction (walls, ceilings, floors) with approved materials providing equivalent protection and rating of the construction being penetrated.
5. Support all conduits from the building structure so that there is no apparent deflection in the runs. Do not support from, or brace to, ducts, other pipes, conduit, or any materials except building structure. Any exposed or concealed conduits which can be physically moved, and which is not properly supported will not be accepted, and additional support or bracing will be required. Install seismic bracing as hereinbefore specified; see Seismic Restraint.
6. Install and secure all equipment with anchors and braces to floors, structural members and walls with sufficient backing, to prevent vibration and/or horizontal displacement under load and seismic force as hereinbefore specified. Follow manufacturer's recommendations for the installation of vibration isolators where required for all equipment requiring such.
7. Provide field built conduit anchors for building expansion joint and thermal expansion control.

E. Support and brace all equipment, devices, conduits, etc. located at upper roof either from the equipment pads or from the overhead framing structure. Do not support or brace from the roof. When supporting from or bracing to overhead, provide all intermediate steel required between structural steel members.

F. Equipment Resiliently Mounted
1. All electrical equipment which is mounted on spring mounts or resilient pads shall be restrained to prevent lateral, vertical, and overturning movement. Restraining devices shall be installed on all sides of equipment. Devices shall be sized in accordance with the requirements of this Section and as shown on the approved shop Drawings.

G. Equipment Suspended from the Structure Above
1. Suspended equipment shall be restrained to prevent lateral and vertical movement. Restrainment devices shall be sized in accordance with the requirements of this Section and as shown on the approved shop Drawings.
2. Included is all suspended electrical equipment such as pull-boxes.

3.3 ADJUSTING AND TESTING
A. Prior to installing conduit bracing, alternate expansion type anchors shall be tested to four times the allowable load. Anchors immediately adjacent to the failed anchors shall also be tested.
Obtain Owner’s Representative approval prior to replacing failed anchors.

END OF SECTION
SECTION 26 51 05

LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Includes
   1. Provide and install lighting, including but not limited to light fixtures, lighting, wiring, and supports. For fixture schedule, refer to electrical drawings.

1.2 REFERENCES

A. AA Aluminum Association.
B. ANSI American National Standards Institute.
D. CDA Copper Development Association.
E. FCC Federal Communications Commission.
F. IEEE Institute of Electrical and Electronics Engineers.
G. IES Illuminating Engineering Society of North America.
H. NAAMM National Association of Architectural Metal Manufacturers.
I. CEC California Electrical Code.
J. UL Underwriter Laboratories.

1.3 SUBMITTALS

A. Submit complete list of lighting products to be furnished, with manufacturer and catalog designations, including currently quoted lead times for product delivery. Should Electrical Contractor anticipate delivery schedule of any specified product may adversely impact construction schedule, he shall bring it to the attention of the Owner at this time.

B. Shall be per Division 1, General Requirements and Section 260500.

C. Submittals shall include the following:
   1. Product data.
      a. Submit data sheets for all specified products.
      b. Submit data sheets in folders, bound alphabetically by fixture type designation.
      c. Submit data sheet for each fixture type, showing type, manufacturer's name, catalog numbers, fixtures specifications, mounting details, finishes, dimensions, accessories, lamps to be used, and evidence of compliance with UL standards.
      d. Submit data sheets for electronic ballasts. Indicate fixture types on applicable ballast data sheets.
      e. Submit product data for emergency battery pack units and automatic lighting
2. Samples.
a. Submit six finish samples, 6" x 6" minimum, of finishes.

3. Substitutions
a. Products of same performance, materials, and finished appearance as specified products are acceptable in accordance with Division 1 requirements for substitutions.
b. Submit the following:
1) Photometric report from independent testing laboratory, calculated according to IES standards, showing:
a) Candela distribution curves and tables in lengthwise, crosswise, and 45deg. horizontal planes through fixture and 5deg. increments of vertical angles.
b) Zonal lumen summary.
c) Efficiency.
d) Spacing ratios.
e) Lamp shielding angles.
f) Coefficients of utilization.
g) Average and maximum luminances at lengthwise, crosswise, and 45deg. horizontal viewing angles and 45deg., 55deg., 65deg., 75deg., and 85deg. vertical viewing angles.
h) Table of visual comfort probabilities, where applicable.

4. Closeout Submittals
a. At project closeout prepare 5 copies of a Lighting Maintenance Manual consisting of the following in a hard-cover binder. Deliver to the Owner's Representative: After review, the Owner's Representative will deliver 3 copies to the Owner.
1) One complete set of approved submittals, including lighting data and shop drawings.
2) List of lamps used in Project, cross-referenced to fixture types, with specific manufacturer's names and ordering codes.
3) Lighting fixture cleaning instructions, including chemicals to be used or avoided.
4) Instructions for code-required testing and maintenance of emergency lighting system.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site and store in unopened cartons in protected location.

1.5 WARRANTY

A. Comply with the requirements of Division 1.

B. All work performed under this section must be warranted to be free of defects in products or workmanship for one year after Substantial Completion date or as noted in Division 1: General Requirements, whichever is longer.

C. Replace transformers, power supplies, or LED components that stop working within warranty period as defined above.

D. Extended warranty for LED light fixtures: See 2.5 below.

E. Once lighting is installed, energized and burned in per manufacturer’s recommendations it shall remain off until controls are operational and commissioning commences.
PART 2 - PRODUCTS

2.1 GENERAL

A. Capacity and Performance: See drawings for nominal selections.
   1. Provide necessary calculations for correct selection and placement of light fixtures, and
      lamps as required to comply with the design criteria and contract documents.

B. Provide lighting fixtures new and complete with mounting accessories, junction boxes, trims, and
   lamps.

C. Provide products with UL labels appropriate to intended installation conditions, or with labels from
   other testing laboratories whose results are acceptable to local inspector, showing compliance
   with UL standards. Labels must be concealed from normal viewing angles.

2.2 FIXTURE CONSTRUCTION

A. Sheet metal: materials and thicknesses as noted on drawings, 20 gage (0.027") minimum, free
   of dents, scratches, oil-can, or other defects.
   1. Painted fixtures: exposed weld marks, joints and seams filled and sanded smooth before
      finishing.
   2. Natural-finish fixtures: fabricated to avoid visible weld marks or discoloration on finished
      fixture.
   3. All edges cleaned and dressed to remove sharp edges or burrs.

B. No light leaks visible in finished room.

C. Exposed end plates and joiners: with concealed fasteners.

D. End-to-end mounted fixtures. Verify row configurations and provide joiners, aligning splines, and
   trims to suit.

E. Hardware
   1. Steel or aluminum interior fixtures: cadmium-plated hardware.
   2. Stainless steel fixtures: stainless steel hardware.

F. Raceways. Where used for through-wiring, fixtures must be approved for use as raceways.

2.3 TRIMS

A. Trims must fit tightly and be held by gravity, spring clips, or mechanical fasteners. Trims must
   not drop out under normal conditions or seismic forces which do not exceed the design criteria
   of the building.

B. Aluminum parabolic louvers and cones: smooth, properly shaped, with Alzak finish in colors as
   indicated.
   1. No to spots or lamp images visible at angles shallower than lamp shielding angle.
   2. Self-flange cones: Cone must bend parallel to ceiling and cover ceiling hole without
      additional trim ring. Unpainted flange, same finish as cone interior.
   3. Cones and louvers for fluorescent fixtures must have permanent anti-iridescence treatment.

C. Plastic lenses and diffusers: with patterns as noted.
   1. Panels shall retain their designed dimensions without change at normal operating
      temperatures. They shall not be subject to warping, crazing, cracking or discoloring,
either in service or when stored under normal conditions in the manufacturer's standard shipping containers.

2. Translucent plastic components: Translucent plastic shall be made of smooth, white, 100% virgin acrylic material. Plastic shall transmit a minimum of 50% of incident light. The plastic shall be non-electrostatic or the finished parts shall be treated with an anti-static agent.

3. Prismatic and clear plastic components: Shall be uncolored 100% virgin acrylic plastic. Plastic lenses shall be manufactured from crystal (uncolored) resin and shall provide resistance to yellowing index (YI) of the plastic after 1,000 hours of accelerated exposure to a carbon arc by ASTM D-1499 does not exceed 3 as measured by ASTM 1925.

4. Acrylic plastic shall not exceed the following fire safety criteria:
   a. Burning Rate (ASTM D635): 2-1/2 inches per minute when tested in 0.060" thickness.
   b. Smoke Density (ASTM D2843)

5. Plastic lenses shall remain in place for at least 15 minutes at 1875 degrees Fahrenheit and shall fall free of fixture at an ambient temperature of at least 200 degrees F below the ignition temperature (measured in accordance with ASTM D2929) of the plastic.

6. All polycarbonate components shall be ultraviolet stabilized.


2.4 FINISHES

A. Factory painted finishes: Follow applicable preparation and finishing standards of AA, ANSI, ASTEM, CDA, NAAMM, and follow coating manufacturer's recommendations.

B. Submit manufacturer's standard white color to the Owner's Representative for review.

2.5 LED AND DRIVERS

A. Definitions of LED Components:
   1. LED light source: LED chip in suitable circuit board or subassembly.
   2. LED module or engine: LED light source plus mechanical, optical, and heat-management components which comprise a replaceable item in a luminaire.
   3. LED luminaire: Complete product including LED module, heat sink, power supply/driver (integral or remote), provisions for code-compliant connections to branch circuit conduit and wiring (including through-wiring if specified), housing suitable for installation conditions and water resistance for dry, damp, or wet location as specified, and mounting hardware as required.

B. Modularity: LED modules and power supplies/drivers must be replaceable in field. Replacement modules shipped during warranty period must match remaining modules in light output and color. Provide spare LED modules and power supplies as noted in Lighting Schedule.

C. Power supplies/drivers: UL-listed component provided by, or as recommended by, LED module or luminaire manufacturer. LED drivers shall be compatible with lighting control system. If remote, provide enclosure suitable for installation conditions and with provisions for connection to branch circuit conduit and wiring (including through-wiring if specified). Constant-current or constant-voltage to suit LEDs, 0.90 min. power factor, 0-10VDC dimming type. Verify compatibility with specified dimmers.

D. LM-79 report: Provide test report from nationally-recognized independent testing laboratory, showing absolute initial photometry and color characteristics per IESNA-LM-79-2008. Also provide IES-format data file for use in calculations.

E. LM-80 report: Provide test report from nationally-recognized independent testing laboratory,
showing lumen output curve with readings every 1,000 hours, failure percentage, and chromaticity shift of LED module after 6,000-hour min. operation per IESNA-LM-80-2008, and graph showing extrapolation to useful life at 70% output (L70 hours). 10% max. failure percentage at 6,000 hours.

F. Lumen output, wattage, and efficacy (lumens/watt): As noted in Lighting Schedule, for entire LED luminaire, not components.

G. Flicker: No perceptible flicker when undimmed or dimmed.

H. Color: As noted in Lighting Schedule.
   1. Color temperature: Nominal correlated color temperature (CCT) 2700, 3000, 3500, 4000, 5000, 6500°K as specified.
   2. Initial color tolerance ("binning"): Expressed as +/-°K from nominal CCT or within MacAdam ellipse steps as specified. If not specified, must be within 7-step MacAdam ellipse, which is allowable tolerance under ANSI C78-337A-2008:
      a. 2700°K: 2725 +/-145
      b. 3000°K: 3045 +/-175
      c. 3500°K: 3465 +/-245
      d. 4000°K: 3985 +/-275
      e. 4500°K: 4503 +/-243
      f. 5000°K: 5028 +/-285
      g. 5700°K: 5665 +/-355
      h. 6500°K: 6530 +/-510
   3. Color rendering index (CRI): Ra average for 8 standard CIE samples. For accent lighting, also comply with specifications for R9 (red) CRI.
   4. Color shift after 6,000 hours: CRI no more than 3 points lower than initial, color temperature tolerance same as for initial

I. Warranty: Minimum three years from date of manufacturer's invoice, includes full material replacement cost of module, luminaire, or power supply/driver. Replacement modules or luminaires provided in response to warranty claims must match light color and output of remaining modules.

J. Labeling: Provide evidence of compliance with UL 8750.


L. Energy Star: For products where Energy Star specifications exist, provide Energy Star-labelled products. Evidence of compliance (e.g. lumens-per-watt from Lighting Facts label based on LM-79 test data) may be acceptable instead of Energy Star label, but Contractor is responsible for determining if this is acceptable to Authority Having Jurisdiction and/or Owner.

M. California Title 24: For "high-efficacy" products, provide certification from California Energy Commission. Evidence of compliance (e.g. lumens-per-watt from Lighting Facts label based on LM-79 test data) may be acceptable instead of CEC certification, but Contractor is responsible for determining if this is acceptable to Authority Having Jurisdiction and/or Owner.

N. Spare LED arrays and drivers: Provide two spare LED arrays and drivers for each fixture type.

2.6 FINISHES

A. Light fixture manufacturer to prepare surfaces and apply primer and topcoats suitable for base metal and installation conditions.
PART 3 - EXECUTION

3.1 PREPARATION AND COORDINATION

A. Locate lighting fixtures in accordance with architectural reflected ceiling plans.

B. Coordinate all lighting installation with other trades. Avoid conflict with location of new ducts, diffusers, sprinklers, speakers, smoke detectors, and other obstructions.

C. If obstructions are encountered which prevent installation of lighting according to drawings, notify the Owner and do not proceed until conflict has been resolved.

3.2 INSTALLATION

A. General:
1. Install lighting fixtures securely, level, plumb, aligned, and in straight rows. Lighting fixtures shall be securely installed so they do not shift during relamping or adjustment.
2. Install in accordance with manufacturer’s instructions.
3. Point-source fixtures - Locate as dimensioned, or in center of tile or on tile joint as drawn: 1/4 inch maximum off-center tolerance.
4. Linear fixtures: 1/4 inch maximum horizontal or vertical alignment variation in any 16 foot portion of run.
5. All fixtures shall be mounted to or suspended from structure. No fixture shall rely upon ceiling grids, ductwork, etc., for support.
6. All junction box cover plates for the lighting branch circuit system located above suspended ceilings, shall be clearly marked with a permanent ink felt pen identifying the branch circuit (both panel number and circuit number) contained in the box.

B. Recessed Fixtures:
1. Point-source fixtures: Provide pre-wired junction box and thermal protection, and provide #12 galvanized steel hanger wires attached to structure from two diagonal corners of the fixture. This is in addition to the ceiling frame hanger wires.
2. Troffer fixtures under 50 lbs. weight: Provide hold-down clip at each fixture corner, and #12 galvanized steel hanger wires attached to structure from two diagonal corners of the fixture. This is in addition to the ceiling frame hanger wires.
3. Troffer fixtures over 50 lbs. weight: Provide hold-down clip at each fixture corner, and #12 galvanized steel hanger wires attached to structure from four corners of the fixture. This is in addition to the ceiling frame hanger wires.
4. Non-accessible ceilings: Provide access to junction boxes, ballasts, transformers, and battery packs through fixture apertures; no access panels in ceiling.
5. Mounting frames: To prevent rusting, provide galvanized steel or cast aluminum frames for installation in damp locations or in plaster ceilings.
6. Holes for Recessed Point-Source Fixtures - Minimum-width fixture trims are specified for this Project. Cut holes to follow fixture housings exactly so no gaps will be visible after trims are installed.
7. Install bottom of housing aligned with finished ceiling.
8. Keep ceiling insulation at least 3 inches away from fixture.
9. Install trims after painting of spaces. Install trims tightly, with no gaps or light leaks.
10. Where required by code, provide approved enclosures for fixtures in fire-rated ceilings.

C. Ceiling-Mounted and Pendant Fixtures:
1. Supports - Provide support for outlet boxes and suspension points so fixtures can be installed securely, including seismic supports per code.
   a. Fixture weight less than 50 lbs at each suspension point, hang from strap or stud on outlet box, or at non-feed points. Provide 1/4 inch-20 stud projecting 3/4 inch below ceiling.
b. Fixture weight 50 lb. or more at each suspension point, hang directly from structure, either independent of outlet box or from stud extending through outlet box to structure.

2. Pendants - Provide horizontal bracing from suspension points to ceiling framing to prevent sideways shifting. Provide diagonal seismic restraint wires above ceiling per code.

D. Wall-Mounted Fixtures:
1. Verify fixture weights and provide backing in wall as required. Fixtures must not droop or tilt away from wall.
2. Wet locations - Install sealant between fixture and outlet box.

3.3 PROJECT CLOSEOUT

A. Quality Control:
1. At Date of Substantial Completion, replace lamps which are not operating properly.
2. Replace any lamps used as work lights during construction phase.
3. Protection wrapping on louvered (parabolic) luminaires shall be removed before installation of furniture, but after finish work is complete.
4. Deliver spare LED’s and drivers to the Owner's representative.

B. Tests:
1. Give advance notice of dates and times for field tests.
2. Provide instruments to make and record test results.
3. Verify normal operation of each luminaire after luminaires have been installed and circuits have been energized.
4. Replace or repair malfunctioning luminaires and components, then retest. Repeat procedure until all units operate properly.
5. Report results of tests.

C. Adjusting and Cleaning:
1. Clean luminaires of handling marks, dust and dirt.
2. Cleaning and touch-up work shall be performed in accordance with luminaire manufacturer’s recommendations.
3. Damaged luminaires or components shall be replaced with new.
5. Verify orientation of directional luminaires prior to installation. Provide all required premium time for aiming and adjustment for exterior lighting fixtures.
6. This includes wall washers, cove lighting, floodlights and adjustable accent luminaires. Contractor shall provide electrician's services to aim, adjust, and focus luminaires, as required, at the direction of Architect/Engineer. These electricians shall be available at times designated by the Architect/Engineer and shall be provided at no extra charge to the Owner over base bid. Contractor shall provide all necessary equipment for luminaire focus including ladders and mechanical lifting systems.

D. Training
1. Contractor shall provide qualified personnel onsite to provide a minimum of one day of training to the Owner's representatives.
2. This training shall cover:
   a. Luminaire use and maintenance.
   b. Group relamping cycles.

END OF SECTION
Marin Center Exhibit Hall

10 Ave of the Flags San Rafael, CA  July 2019

Interior Construction Materials:

Flooring: Concrete subfloor. Flooring not part of this survey
Walls and Ceilings: Gypsum board and joint compounds for most walls. Some ceiling surfaces use acoustic ceiling panels in a T-bar grid. See plan for locations.

HVAC and Mech: Forced air furnace / AC distributed through roof mounted sheet metal ductwork. HVAC and ducts are non-asbestos where tested. Most of the insulation products are fiberglass.

Miscellaneous Materials: NA

Exterior Construction Materials:

Built Up Roofing: The main roofs are built up tar and felts. The roof jacks, flashings, and patched areas use a gray colored fibered roof cement. Parts of the flat built up roof have been replaced in the past. The new roof areas have not been tested for asbestos content. The built up tar and felts in the older roofing have all tested negative for asbestos. The gray colored roof cements have mostly tested positive for asbestos content. The newer roofing should be tested prior to any future disturbance. The roof cements must be abated prior to any disturbance or removal. The exterior stucco has not been tested and should be tested prior to disturbance or demolition.

General Information:

A safety meeting for the construction workers is required by the project manager / construction department, prior to any abatement and demolition at this site. A survey and report are limited in nature, due to limited access. Call for additional site inspections for additional materials that may be uncovered in the demolition process.

Environmental Survey for Renovation

Building Data:

Total Main Bldg. Area: Not Applicable.

Positive ACM at Site:
Asbestos was found in the: Drywall Joint Compounds.

If additional materials are found that do not match the descriptions of the samples analyzed, call for additional testing.

Abatement Specs:
Abatement is required for the materials listed in the sample logs, if disturbed. See tables and list above.

Monte Deignan & Associates
CAC 93-0879
P.O. Box 546 Larkspur, CA 94977
(415) 927-9038  Fax (415)927-9078
March 27, 2020

Ms. Mary Hobson
Public Works, Capital Projects
County of Marin
3501 Civic Center Drive
San Rafael, CA 94902

Asbestos Survey for County of Marin
Exhibit Hall
10 Avenue of the Flags
San Rafael, CA

I. INTRODUCTION
This report presents our limited inspection and bulk sampling for asbestos containing materials ("ACM") at the Marin Center Exhibit Hall. The inspection was performed on December 11, 2017 and July 15, 2019. The building areas inspected are the exhibit hall, offices, shop space and storage room offices. The primary purpose of this inspection is to identify ceiling and wall materials that contain asbestos that must be abated or removed prior to seismic investigation of the structure. Our scope of work included an asbestos inspection consisting of visual inspection, bulk sampling, laboratory analysis, and the generation of the report findings. The inspection was performed by Mr. Monte Deignan, a Cal/OSHA certified asbestos consultant and AHERA accredited building inspector.

II. REGULATORY OVERVIEW
The following oversight agencies and regulations may affect the implementation of this project as described below:

Federal Agencies
Environmental Protection Agency ("EPA"), National Emission Standards for Hazardous Air Pollutants ("NESHAP") Notification 40 CFR 61 Part M
- Requires notification when removal or renovation involves greater than 160 square feet or 260 linear feet of friable asbestos containing materials

State Agencies/Regulations
Bay Area Air Quality Management District ("BAAQMD")
- Responsible for enforcement of the federal NESHAP regulations
- Requires notification for removal of all friable ACM if exceeding 100 square feet or linear feet
- Requires notification prior to demolition regardless of ACM amounts or presence
California Occupational Safety and Health Administration ("Cal/OSHA")
- Responsible for enforcement of Federal OSHA standards
- Requires friable and non-friable ACM exceeding 100 square feet to be removed by a registered Cal/OSHA asbestos abatement contractor
- Requires that contractors be licensed by the California Contractors State License Board ("CSLB")

AB 3713 Asbestos Notification Law (Connelley Act)
- Requires notification of tenants, employees, and co-owners about the presence and locations of ACM, and the potential health effects

Asbestos Real Estate Disclosure Law
- California state law requires the disclosure of ACM presence during real estate transactions.

III. ASBESTOS ANALYSIS PROCEDURES

Sampling Strategy
The objective of bulk sampling was to determine through laboratory analysis whether suspected materials at this site contain asbestos, and if so, what type and concentrations measured in percentages. Prior to the collection of any samples, all building materials were separated into distinct areas of homogeneity. A homogeneous area represents an area delineated by functional and visual similarity. The area may be further defined by its location within the building, or the age of the material.

After homogeneous areas were identified, a sufficient number of samples were collected for submittal to the laboratory for polarized light microscopy ("PLM") analysis. Because asbestos containing materials have compositional variability, it is possible to obtain different results from samples taken from the same materials in the same building. Therefore, a homogeneous sampling area with at least one positive result will result in the entire area being designated as having asbestos containing material ("ACM").

The collection of bulk samples was based on the guidelines established by the EPA for school buildings (Asbestos Hazard Emergency Response Act ("AHERA"), 40 CFR Part 763, EPA, 1987). In addition, the Asbestos in Schools Hazard Abatement Reauthorization Act ("ASHARA") establishes guidelines for the inspection of commercial facilities. AHERA and ASHARA guidelines were used to insure the most reliable procedures for sample collection and reporting.

Standard sampling tools and procedures were used to obtain samples from the suspected materials. The samples were bagged and submitted to the laboratory under standard chain of custody protocols. Representative sample locations were noted on the floor plans of the building and are referenced on the chain of custody form from the laboratory, Microanalytical Laboratories of Emeryville, California.
Laboratory Analysis
Laboratory analysis was based on polarized light microscopy supplemented by dispersion staining to observe asbestos mineral content. For the purposes of this survey, ACM is defined as any material containing more than 1% asbestos by weight, volume, or point count. For Cal/OSHA purposes, ACCM is defined as any material with greater than 0.1% asbestos.

IV. VISUAL SURVEY FINDINGS AND SAMPLING
On the morning of December 11th and July 15, 2019, the inspection of the property was performed. The age of the building and the use of asbestos containing materials are usually related. Most building from the 1970’s used asbestos containing material (ACM) for many components such as flooring, drywall, roofing, insulation, etc.

Walls and Structural Components
The exhibit hall facility consists of exterior and interior walls of concrete block and wood frame roof structure, on a concrete slab foundation. The interior walls are mostly drywall.
The ceiling at flat roof areas are drywall materials with joint tape compounds. Portions of the ceiling consist of acoustic ceiling panels, set in a t-bar grid.

Roofing Components
The roofing materials were replaced in recent years and covered by earlier reports by others. The current roofing was not tested for this inspection, but should be tested prior to any disturbance or removal.

Flooring Components
The flooring components were not a part of this inspection.

Mechanical Systems, Utilities, etc.
The mechanical and HVAC components were not a part of this inspection.

Supplemental Environmental Concerns
The scope of this inspection and report are limited to asbestos containing materials in the buildings. There are however additional concerns that should be addressed prior to and during the renovation of the buildings. The owners of the property should consider obtaining additional advice from qualified professionals regarding the presence of additional hazards. The following are examples of what may be found:

- The lighting in some areas of the building is by fluorescent fixtures. These lights use lamps that contain mercury. The ballasts may also contain PCB oils. All of these fixtures and their components should be tested / examined prior to demolition.
- The paints used on the building may contain lead. The renovation process may release these materials into the surrounding area. Liberal application of water and use of HEPA vacuums for
clean up should be used to reduce exposure levels. The demolition workers should observe lead specific health and safety practices in the work area. Interior and exterior sampling of the different paints may find that they are lead containing for the most Contractors should be advised to follow “Lead in Construction” OSHA regulations, as well as the current EPA Renovation, Remodel, and Painting (RRP) regulations.

- This is only a preliminary listing of the possible hazards. Additional materials may be found hidden by walls, or other materials. The demolition process may also create additional hazards from the existing building components at the site. The demolition workers are responsible for their own health and safety at the site. The owners of the property should advise contractors and persons involved with the demolition of the potential hazards.

**Sampling of Building Materials**

Samples were collected from fourteen different building materials and analyzed for asbestos. Since no other suspect materials could be found, the sampling was considered complete. All of the samples were catalogued as to location, condition, and submitted for PLM analysis. The samples were hand-delivered to the laboratory using our standard chain of custody protocols on the morning of December 12, 2017 and July 15, 2019.

The description of the materials, locations and quantity are listed on the chain of custody forms and floor plans. The titles for the various spaces in the house were assumptions based on the apparent use of the space. Photographs were also taken to document the location and conditions of some of the materials. Copies of the floor plan and chain of custody forms are attached with this report.
V. CONCLUSIONS

Based on the visual inspection, sampling and laboratory analysis, the following results are noted:

• The drywall joint compounds contain asbestos at most locations.
• The acoustic ceiling spray does not contain asbestos.
• The plaster at office and hallway areas do not contain asbestos.
• Acoustic ceiling panels do not contain asbestos.
RECOMMENDATIONS  Based on the visual inspection, sampling and laboratory analysis conducted, the following recommendations apply to the materials found on this site:

1. The drywall and gypsum board materials, which are positive for asbestos, shall be removed prior to renovation, if applicable. The work shall be performed using containment, wet methods, following all applicable regulatory guidelines. Due to one or more drywall samples yielding positive results, all of the drywall joint compounds shall be treated as asbestos containing material (ACM).

2. The acoustic ceiling panels, acoustic ceiling spray, and plaster were non detect at the locations sampled and no abatement regulations apply to these materials. If other materials are uncovered during the renovation project, arrange for additional inspections.

3. Any demolition or paint prep work that sands, abrades, or otherwise disturbs the interior paint must follow the DHS and Cal/OSHA regulation for “Lead in Construction”. Samples from exterior paints at door jambs, and facia boards may contain elevated levels of lead and may classified as Lead Based Paints (LBP), with more than 5000 ppm of lead. Lead based paint sampling is recommended prior to any substantial renovation project.

Notify the asbestos consultant 24-48 hours prior to start of any removal or abatement work to arrange for work monitoring and air sampling during the initial phase of the renovation or demolition. The construction manager of the project should verify that the abatement contractor is qualified to perform the work and understands the various requirements and restrictions for working with asbestos containing materials. Any chemicals to be used on the project must be accompanied by a Materials Safety Data Sheet (“MSDS”). Compliance with this section is not required by asbestos regulations.
VI. LIMITATIONS OF LIABILITY

The work and resulting recommendations for this survey are in accordance with generally accepted building survey practices and the AHERA protocols for asbestos inspections. The report generators provide no other guarantees, either expressed or implied. Conclusions and recommendations presented in issued reports are qualitative judgments based on the prevailing regulations affecting the scope of this work at the time of the inspection of the particular building(s). The scope of work was limited to the visible and accessible parts of the building, limited sampling analysis, and data review. The client recognizes that site conditions or access may vary from those encountered at the time of the inspection, and that changing conditions may cause us to alter our recommendations. We have attempted to view as much of the building as possible, without opening hidden areas, removing existing drywall, or damaging existing property. If conditions or situations occur that expose these non-inspected areas, we will be glad to continue our inspection at that time for those locations.

This report is for the express use of the client for whom it was prepared, and is not intended for use by third parties. The authors of this report will not be responsible for interpretation or use by third parties of any of the information contained in this report. The building survey for asbestos is intended to provide an initial assessment of asbestos containing material at specific locations, and may not be valid at other locations or for other unique materials. Additional site evaluations could result in information that would lead us to revise our conclusions and recommendations. If any doubts exist, call for additional inspections or testing.

Respectfully submitted,

Monte Deignan
CAC 93-0879
CDPH Lead Inspector 2599
The interior renovation work at the hallway/lounge will include installing a doorway through the wall. The wall material at the hallway appears to be wood siding or plywood. The wall at the existing lounge is gypsum board finished with joint compounds. Vinyl cove base is used at the floor next to the carpet floor covering. The hallway uses an acoustic plaster for the ceiling.

Photo 1 shows the hallway looking toward the rest rooms. The future doorway will be installed at the middle section of the photo. Photo 2 shows the interior of the lounge where the interior of the doorway will be placed. The drywall joint compound contains < 1% asbestos, based on the PLM lab results. Removal must be performed by asbestos abatement contractors.

The samples of the cove base, concrete block, mortar, acoustic ceiling, and plaster/stucco were non detect for asbestos. Refer to the attached lab report for specific details. Materials from other parts of the building may be different and the results may not be the same. Additional sampling is required for the same materials at other locations.
The interior renovation work at the hallway / lounge will include installing a doorway through the wall. The wall material at the hallway appears to be wood siding or plywood. The wall at the existing lounge is gypsum board finished with joint compounds. Vinyl cove base is used at the floor next to the carpet floor covering. The hallway uses an acoustic plaster for the ceiling.

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## MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084 Monte Deiagnan
Monte Deiagnan & Associates
P.O. Box 540
Larkspur, CA 94977

**PROJECT:**

**EXHIBITION HALL**

**Micro Log In:**

**259564**

**Total Samples:**

13

**Date Sampled:**

07/15/1999

**Date Received:**

07/15/1999

**Date Analyzed:**

07/15/1999

### SAMPLE IDENTIFICATION

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### DOMINANT OTHER MATERIALS

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**Technical Supervisor:**

Gamini Ranatunga, Ph.D.

**Date Reported:**

7/15/2019

NVLAP Lab Code 101872-0. Analyses use Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow EPA – Appendix E to Subpart E of 40 CFR Part 768. Inherent Method for the Determination of Asbestos in Bulk Insulation Samples (originally published 1982), and EPA-800/909-116 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 µm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite asbestos or actinolite asbestos may be indistinguishable by PLM from some similar, non-regulated amphiboles (e.g., the "Libby Amphiboles" richterite and winchite), and should be confirmed by TEM. The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PLM Point Counting or TEM weight percent analyses are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to: cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample homogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible, if asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASPBESTOS DETECTED" in a homogenous sample or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions or material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertain only to the samples analyzed. NFM = Non-fibrous materials.
<table>
<thead>
<tr>
<th>Client #</th>
<th>SAMPLE IDENTIFICATION</th>
<th>COMPOSITE DW &amp; JC: &lt;1% CHRYSOTILE ASBESTOS</th>
<th>COMPOSITE DW &amp; JC: &lt;1% CHRYSOTILE ASBESTOS</th>
<th>DOMINANT OTHER MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client #</td>
<td>CEB-206</td>
<td>COMPOSITE DW &amp; JC: &lt;1% CHRYSOTILE ASBESTOS</td>
<td></td>
<td>10% CELLULOSE</td>
</tr>
<tr>
<td>Micro #: 259564-06</td>
<td>Analyst: RK</td>
<td>DRYWALL AND JOINT COMPOUND KITCHEN AT NORTH</td>
<td>DRYWALL: ND</td>
<td>NFM: &quot;PORTLAND CEMENT (CALCAREOUS)&quot;</td>
</tr>
<tr>
<td>Client #:</td>
<td>CEB-207</td>
<td>TAPE: ND COATING (BEIGE): ND</td>
<td></td>
<td>80% CELLULOSE</td>
</tr>
<tr>
<td>Micro #: 259564-07</td>
<td>Analyst: RB</td>
<td>DUCT TAPE, BEIGE HVAC IN MECH ROOM</td>
<td>CONCRETE: ND</td>
<td>NFM: &quot;ROCK FRAGMENTS, CARBONATE, BINDER&quot;</td>
</tr>
<tr>
<td>Client #:</td>
<td>CEB-208</td>
<td>CONCRETE BLOCK, GRAY MECHANICAL ROOM</td>
<td>CONCRETE: ND</td>
<td>NFM: &quot;ROCK FRAGMENTS, CARBONATE, BINDER&quot;</td>
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<tr>
<td>Client #:</td>
<td>CEB-209</td>
<td>MORTAR: ND</td>
<td>MORTAR: ND</td>
<td>NFM: &quot;ROCK FRAGMENTS, CARBONATE, BINDER&quot;</td>
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<tr>
<td>Micro #: 259564-09</td>
<td>Analyst: RB</td>
<td>MORTAR: GRAY MECHANICAL ROOM</td>
<td>MORTAR: ND</td>
<td>NFM: &quot;ROCK FRAGMENTS, CARBONATE, BINDER&quot;</td>
</tr>
<tr>
<td>Client #:</td>
<td>CEB-210</td>
<td>ACOUSTIC CEILING SPRAY, WHITE HALL AT NORTHWEST</td>
<td>ACOUSTIC CEILING: ND</td>
<td>NFM: &quot;PORTLAND CEMENT (CALCAREOUS), MUC. PARTICLES&quot;</td>
</tr>
<tr>
<td>Micro #: 259564-10</td>
<td>Analyst: RB</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Technical Supervisor: 

Gamini Ranatunga, Ph.D. 

Date Reported: 7/15/2019

NVLAP Lab Code 101872-0. Analyses use Polarized Light Microscopy (PLM), Micro Analytical SOP PLM-101. Basic techniques follow EPA – Appendix E to Subpart E of 40 CFR Part 763; Interim Method for the Determination of Asbestos in Bulk Insulation Samples” (originally published 1982), and EPA-800R93-118 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos fibers (much less than 1%) may not be reliable or reproducible by PLM. Weight percentage cannot be determined by PLM. Absence of asbestos is not detectable by PLM. Absence of asbestos in dust, debris, and some contaminant materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM) Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Temotile-asbestos or ferriacte-asbestos may be indistinguishable by PLM from some similar, non-asbestos amphiboles (e.g. the Libby Amphiboles) riebeckite and winchite), and should be confirmed by TEM. The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analyses are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos. Common interferences include, but are not limited to, cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, taic, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible, if asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in a homogenous sample, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; composting is based on customers' description of material as "joint compound." Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC): all results have been determined to be within acceptable limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST of any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and permits only to the samples analyzed. NFM = Non-fibrous materials.
### MICRO ANALYTICAL LABORATORIES, INC.
**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

### PROJECT:
**EXHIBITION HALL**

<table>
<thead>
<tr>
<th>Client #</th>
<th>Sample Identification</th>
<th>Analyst</th>
<th>Quantity (Area %) / Types / Layers</th>
<th>Asbestos Information</th>
<th>ND = No Asbestos Detected</th>
<th>Dominant Other Materials</th>
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<tbody>
<tr>
<td>CEH-211</td>
<td>Micro #: 259564-11</td>
<td>RB</td>
<td>PLASTER: ND</td>
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<td>NFM: GYPSUM (CALCIC SULFATE)</td>
<td>MCA</td>
</tr>
<tr>
<td></td>
<td>PLASTER, WHITE HALL AT NORTHWEST</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>CEH-212</td>
<td>Micro #: 259564-12</td>
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<td>ACOUSTIC CEILING: ND</td>
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<td>NFM: GYPSUM (CALCIC SULFATE), MICA PARTICLES</td>
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<tr>
<td></td>
<td>ACOUSTIC CEILING SPRAY WHITE HALL AT WEST</td>
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<td></td>
<td></td>
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<td>CEH-213</td>
<td>Micro #: 259564-13</td>
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<td>NFM: GYPSUM (CALCIC SULFATE)</td>
<td>MCA</td>
</tr>
<tr>
<td></td>
<td>PLASTER, WHITE HALL AT WEST</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Technical Supervisor:
Gamini Ranatunga, Ph.D.  
Date Reported: 7/15/2019  
Date Reported: 7/15/2019

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<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEH-201</td>
<td>DRYWALL COMPOUND</td>
<td>OFFICE @ NORTH WALL</td>
<td>NO BOARD</td>
<td>1</td>
</tr>
<tr>
<td>CEH-202</td>
<td>AGOUSTIC CEILING SPRAY WHITE</td>
<td>OFFICE @ NORTH WALL</td>
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<tr>
<td>CEH-203</td>
<td>PLASTER, WHITE</td>
<td>OFFICE @ NORTH</td>
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<tr>
<td>CEH-204</td>
<td>AGOUSTIC CEILING SPRAY WHITE</td>
<td>KITCHEN @ NORTH</td>
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<tr>
<td>CEH-205</td>
<td>PLASTER, WHITE</td>
<td>KITCHEN @ NORTH</td>
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<tr>
<td>CEH-206</td>
<td>DRYWALL &amp; JOINT COMPOUND</td>
<td>KITCHEN @ NORTH</td>
<td>BOARD INCL</td>
<td>6</td>
</tr>
<tr>
<td>CEH-207</td>
<td>DUCT TAP, BEIGE</td>
<td>HVAC IN MCHK RM</td>
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<tr>
<td>CEH-208</td>
<td>CONCRETE BLOCK, GRAY</td>
<td>MECHANICAL ROOM</td>
<td></td>
<td>8</td>
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<tr>
<td>CEH-209</td>
<td>MORTAR, GRAY</td>
<td>MECHANICAL RM</td>
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<td>9</td>
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<tr>
<td>CEH-210</td>
<td>AGOUSTIC CEILING SPRAY WHITE</td>
<td>HALL @ NORTH WEST</td>
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</tbody>
</table>

Laboratory Name / Address: Microanalytical Laboratory Emeryville, CA
Bulk Sample Log & Laboratory Request Form

Monte Deignan & Associates

Client: County of Marin
Public Works - Capital Projects

Project: Exhibition Hall

Collected By: MD  Report To: montedeignan@mac.com
Date: July 15, 2019

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6H-211</td>
<td>PLASTER, WHITE</td>
<td>HALL @ NORTHWEST</td>
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<tr>
<td>C6H-212</td>
<td>RACOUSTIC CEILING SPRAY</td>
<td>HALL @ WEST</td>
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<tr>
<td>C6H-213</td>
<td>PASTE, WHITE</td>
<td>HALL @ WEST</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Laboratory Name/Address: Microanalytical Laboratory Emeryville, CA

Released By: Monte Deignan  Transferred To:  Received By: TMM 7/15/19 (3)
The roof on the Marin Center Exhibition Hall consists of built up tar and felt roofing, with a #90 mineral surface cap sheet. The HVAC equipment extends above the flat roof of the Exhibition hall. To screen the sheet metal components, a low stucco parapet wraps around the HVAC ductwork and air handlers. For this inspection the built up roofing, roof cements, tar, duct tape, caulk- ing, and #90 roll roofing were tested. The roof cements are the only material that contains asbestos at this site. The roof cements are found at roof jacks, roof seams, and patch locations. Photo 1 above shows the HVAC equipment and ductwork at the East end of the Exhibit Hall roof.

Cal / OSHA registration will be required for any contractor disturbing any amount of asbestos containing materials (ACM) on this project. The work at this site is classified as Class 2, under Cal / OSHA's asbestos work categories. Any of the exterior roofing materials containing asbestos are considered as non-friable. All of the Cal / OSHA regulations pertaining to worker safety, such as fall protection, will be enforced on this project. See the complete report for more information.
Photo 3 shows the equipment on the lower roof at the Northwest side of the roof. The sampling plan labels the two units in the well as unit A & B.

For this inspection the built up roofing, roof cements, tar, stucco, and #90 roll roofing were tested. The gray colored roof cement is the only material that contains asbestos at this site. The gray colored cement may be combined or mixed with newer applications of black colored tar.

Photo 4 shows the typical application of the roof cements at the corner of the roof curb. The roof cements are found at roof jacks, roof seams, and patch locations.

Cal / OSHA registration will be required for any contractor disturbing any amount of asbestos containing materials (ACM) on this project. The work at this site is classified as Class 2, under Cal / OSHA's asbestos work categories. All of the exterior roofing materials are considered as non-friable. All of the Cal / OSHA regulations pertaining to worker safety, such as fall protection, will be enforced on this project.

See the complete report for more information.
Building Inspection Materials Listing

Marin Center Exhibit Hall  San Rafael, CA
Date : March 23, 2007                   Project Manager : Mr. Cam Isaza
Inspector: Monte Deignan   CAC 93-0879

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Material Description</th>
<th>Location</th>
<th>Area</th>
<th>% Asbestos</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHR-01</td>
<td>#90 Mineral Surf. Roof, Gray</td>
<td>HVAC Unit 1</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-02</td>
<td>Built up Tar and Felt, Black</td>
<td>HVAC Unit 1</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-03</td>
<td>Roof Cement, Gray</td>
<td>HVAC Unit 2</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-04</td>
<td>Caulking, Light Gray</td>
<td>HVAC Unit 1</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-05</td>
<td>Duct Tape, White</td>
<td>HVAC Unit 2</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-06</td>
<td>Roof Tar, Black &amp; Gray</td>
<td>HVAC Unit 3 flashing</td>
<td>All</td>
<td>10% Chrysotile</td>
<td>Follow Class II ACM abatement regulations</td>
</tr>
<tr>
<td>EHR-07</td>
<td>#90 Mineral Surf. Roof, Gray</td>
<td>HVAC Unit 4</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-08</td>
<td>Built up Tar and Felt, Black</td>
<td>HVAC Unit 4</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
<tr>
<td>EHR-09</td>
<td>Roof Tar, Black</td>
<td>HVAC Unit 4</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
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<tr>
<td>EHR-10</td>
<td>Roof Cement, Gray</td>
<td>HVAC Unit 5</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
</tbody>
</table>

Comments / Notes :
Note 1: The roof cements are found at scattered locations on roof jacks, storm collars, flashing, etc. All of the gray colored roof cements should be treated as ACM, since one or more samples are positive for asbestos.
### Building Inspection Materials Listing

**Marin Center Exhibit Hall**  San Rafael, CA  
**Date:** March 23, 2007  
**Inspector:** Monte Deignan  
**Project Manager:** Mr. Cam Isaza  
---

#### Sample # | Material Description | Location | Area | % Asbestos | Recommendations
--- | --- | --- | --- | --- | ---
EHR-11 | #90 Roll Roof Membrane | HVAC Unit A | NA | None Detected | No abatement regulations apply to this material
EHR-12 | Built up Tar and Felt, Black | HVAC Unit A | NA | None Detected | No abatement regulations apply to this material
EHR-13 | Roof Cement, Black / White | HVAC Unit A | NA | None Detected | No abatement regulations apply to this material
EHR-14 | Roof Tar, Black | HVAC Unit A | NA | None Detected | No abatement regulations apply to this material
EHR-15 | Duct Caulking, Beige | HVAC Unit A | NA | None Detected | No abatement regulations apply to this material

---

**Comments / Notes:**

---
<table>
<thead>
<tr>
<th>Client</th>
<th>EHR-01</th>
<th>Sample</th>
<th>93704-01 Analyst: KM PAK #90 MINERAL SURFACE ROOF, GRAY HVAC UNIT 1</th>
<th>TAR WITH GRAVEL: NONE DETECTED FELT: NONE DETECTED</th>
<th>20% FIBROUS GLASS</th>
<th>Micro Log In</th>
<th>93704</th>
<th>Total Samples 15</th>
<th>Date Analyzed 04/02/2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>EHR-02</td>
<td>Sample</td>
<td>93704-02 Analyst: KM PAK BUILT UP TAR &amp; FELT, BLACK HVAC UNIT 1</td>
<td>TAR WITH SAND: NONE DETECTED FELT: NONE DETECTED</td>
<td>20% FIBROUS GLASS</td>
<td>Micro</td>
<td>Log In</td>
<td>93704</td>
<td>Total Samples 15</td>
</tr>
<tr>
<td>Client</td>
<td>EHR-03</td>
<td>Sample</td>
<td>93704-03 Analyst: KM PAK ROOF CEMENT, GRAY HVAC UNIT 2</td>
<td>NONE DETECTED</td>
<td>5% CELLULOSE</td>
<td>Micro</td>
<td>Log In</td>
<td>93704</td>
<td>Total Samples 15</td>
</tr>
<tr>
<td>Client</td>
<td>EHR-04</td>
<td>Sample</td>
<td>93704-04 Analyst: KM PAK CAULKING, LIGHT GRAY HVAC UNIT 1</td>
<td>NONE DETECTED</td>
<td>5% CELLULOSE</td>
<td>Micro</td>
<td>Log In</td>
<td>93704</td>
<td>Total Samples 15</td>
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<tr>
<td>Client</td>
<td>EHR-05</td>
<td>Sample</td>
<td>93704-05 Analyst: KM PAK DUCT TAPE, WHITE HVAC UNIT 2</td>
<td>TAPE: NONE DETECTED GLUE: NONE DETECTED</td>
<td>3% SYNTHETIC FIBERS</td>
<td>Micro</td>
<td>Log In</td>
<td>93704</td>
<td>Total Samples 15</td>
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</tbody>
</table>

Technical Supervisor: Baojia Ke, Ph. D. Date Reported 4/2/2007

Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1.1 um may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM and should be confirmed by Transmission Electron Microscopy (TEM). The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal/OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PFM Point Counting or TEM is recommended. Only dominant non-asbestos materials are indicated. Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible. If asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) Codes: A1A2 = results within acceptance limits, B = no asbestos in lab blank; R = resolved after review. Accreditation by NIST / NVLAP (Lab Code 101872-0). CA ELAP Certification #1037. EPA 1993 method is based on EPA Interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc., shall not be reproduced except in full, and pertains only to the samples analyzed. ND = NO ASBESTOS DETECTED.

5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824
# MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - PLM (EPA/600/R-93/116, 1993)**

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

**PROJECT:**

**EXHIBIT HALL ROOF PROJECT**

<table>
<thead>
<tr>
<th>Client</th>
<th>Micro</th>
<th>Analyst</th>
<th>TAR BLACK: NONE DETECTED</th>
<th>TAR GRAY: 10% CHRYSOTILE</th>
<th>DOMINANT OTHER MATERIALS</th>
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**Total Samples:** 93704

**Date Sampled:** 03/23/2007

**Date Received:** 04/01/2007

**Date Analyzed:** 04/02/2007

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Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PLM Point Counting or TEM is recommended. Only dominant non-asbestos materials are indicated. Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible. If asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) Codes: A1/A2 = results within acceptance limits; B = no asbestos in lab blank; R = resolved after review. Acceptance by NIST / NVLAP (Lab Code 101872-0), GA ELAP Certification #1037. EPA 1993 method is based on EPA interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc. shall not be reproduced except in full, and pertains only to the samples analyzed. ND = NO ASBESTOS DETECTED.

5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824

---

**Technical Supervisor:** Baojia Ke, Ph. D. 4/2/2007
## Sample Identification

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<td>Material</td>
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<td>BUILT UP TAR &amp; FELT, BLACK HVAC UNIT A</td>
<td>ROOF CEMENT, BLACK / WHITE HVAC UNIT A</td>
<td>ROOFING TAR, BLACK HVAC UNIT A</td>
<td>DUCT CAULKING, BEIGE HVAC UNIT B</td>
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<td>Matrix: Roofing; Tar ETC. QC: A2</td>
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<tr>
<td>5 % CELLULOSE</td>
<td>Matrix: Roofing; Tap ETC. QC: A2</td>
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<td>2 % FIBROUS GLASS</td>
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<tr>
<td>2 % FIBROUS GLASS</td>
<td>Matrix: Carbonate QC: A2</td>
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**Technical Supervisor:**

![Signature]

Date Reported: 4/2/2007

Baojia Ke, Ph. D.

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Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal/OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM is recommended. Only dominant non-asbestos materials are indicated. Interferences may prevent detection of small asbestos fibers, and fiber determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible. If asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) Codes: A1A2 - results within acceptance limits, B = no asbestos in lab blank; R = resolved after review. Accreditation by NIST / NVLAP (Lab Code 101672-0), CA GLAP Certification #1037. EPA-1990 method is based on EPA Interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc. shall not be reproduced except in full, and pertains only to the samples analyzed. ND = NO ASBESTOS DETECTED.
**Bulk Sample Log & Laboratory Request Form**

**Client:** County of Marin Public Works  
**City, State:** San Rafael, CA 94901  
**Phone:**  
**Contact:**  
**Project Name / Site:** Exhibit Hall Roof Project  
**Collected By:** MD  
**Report To:** MD  
**Date:** 03-23-07

<table>
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<th>Sample</th>
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<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
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**Laboratory Name / Address:** Micro Analytical Lab  
5900 Hollis Street Suite M  
Emeryville, CA 94608

**Released By:**  
**Transferred To:** MICRO  
**Received By:**
### Bulk Sample Log & Laboratory Request Form

**Client:** County of Marin Public Works  
**City, State:** San Rafael, CA 94901  
**Phone:**  
**Contact:**  
**Project Name / Site:** Exhibit Hall Roof Project  
**Collected By:** MD  
**Report To:** MD  
**Date:** 03-23-07

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**Analysis Requested:**  
- PLM  
- TEM  
- Pb  
- Misc.  
- Rush  
- 24 Hr.  
- 48 Hr.  
- 72 Hr.

**Laboratory Name / Address:** Micro Analytical Lab  
5900 Hollis Street Suite M  
Emeryville, CA 94608

**Released By:** Monte Deignan  
**Transferred To:**  
**Received By:** Stevan  
**Page:** 2 Of 2
Marin County Exhibit Hall

Building Data:

Total Main Bldg. Area: Not Applicable.

Positive ACM at Site:
Asbestos was found in the: Drywall Joint Compounds and drywall texture coating at auditorium and stage ceiling areas. If additional materials are found that do not match the descriptions of the samples analyzed, call for additional testing.

Abatement Specs:
Abatement is required for the materials listed in the sample logs, if disturbed. See tables and list above.

Interior Construction Materials:

Flooring: Carpet over wood or concrete subfloor.

Walls and Ceilings: Gypsum board and joint compounds for most walls. Most ceiling surfaces have a heavy spray applied texture coating. The lobby area and control booth have spray applied acoustic ceiling. See plan for locations.

HVAC and Mech: Forced air furnace / AC distributed through fiberglass insulated sheetmetal ductwork.

Miscellaneous Materials: NA

Exterior Construction Materials:

Foundation: Concrete slab foundation, on grade.

Exterior Siding: Concrete block and exterior stucco, painted.

Roofing: #90 mineral surface rool roofing for low slope roof for main roof areas. Fibered roof cements at roof jacks, seams, and patches. Exterior sheet metal ductwork is sealed with a heavy exterior roof cement or caulk- ing.

General Information:
A safety meeting for the construction workers is required by the project manager / construction department, prior to any abatement and demolition at this site. A survey and report are limited in nature, due to limited access. Call for additional site inspections for additional materials that may be uncovered in the demolition process.
Asbestos Survey Report

August 18, 2010

Mr. Cam Isaza
Capital Projects
County of Marin
3501 Civic Center Drive
San Rafael, CA 94902

Asbestos Survey for Marin County Exhibit Hall Theater
Avenue of the Flags San Rafael, CA

I. INTRODUCTION
This report presents our limited inspection and bulk sampling for asbestos containing materials ("ACM") at the exhibit hall showcase theater auditorium. The remainder of the building was not inspected and is excluded from this report. The inspection was performed on June 15, 2010 and a supplemental roof inspection was performed on July 15, 2010. The inspections at the site examined the interior of the theater and the roof areas above the theater, which are scheduled for renovation. The primary purpose of this inspection is to identify materials, which contain asbestos, which must be removed prior to renovation of the structure. Our scope of work included an asbestos inspection consisting of visual inspection, bulk sampling, laboratory analysis, and the generation of the report findings. The inspection was performed by Mr. Monte Deignan, a Cal/OSHA certified asbestos consultant and AHERA accredited building inspector.

II. REGULATORY OVERVIEW
The following oversight agencies and regulations may affect the implementation of this project as described below:

Federal Agencies
Environmental Protection Agency ("EPA"), National Emission Standards for Hazardous Air Pollutants ("NESHAP") Notification 40 CFR 61 Part M
• Requires notification when removal or renovation involves greater than 160 square feet or 260 linear feet of friable asbestos containing materials

State Agencies/Regulations
Bay Area Air Quality Management District ("BAAQMD")
• Responsible for enforcement of the federal NESHAP regulations
• Requires notification for removal of all friable ACM if exceeding 100 square feet or linear feet
• Requires notification prior to demolition regardless of ACM amounts or presence
California Occupational Safety and Health Administration ("Cal/OSHA")

- Responsible for enforcement of Federal OSHA standards
- Requires friable and non-friable ACM exceeding 100 square feet to be removed by a registered Cal/OSHA asbestos abatement contractor
- Requires that contractors be licensed by the California Contractors State License Board ("CSLB")

AB 3713 Asbestos Notification Law (Connelley Act)

- Requires notification of tenants, employees, and co-owners about the presence and locations of ACM, and the potential health effects

Asbestos Real Estate Disclosure Law

- California state law requires the disclosure of ACM presence during real estate transactions.

III. ASBESTOS ANALYSIS PROCEDURES

Sampling Strategy

The objective of bulk sampling was to determine through laboratory analysis whether suspected materials at this site contain asbestos, and if so, what type and concentrations measured in percentages. Prior to the collection of any samples, all building materials were separated into distinct areas of homogeneity. A homogeneous area represents an area delineated by functional and visual similarity. The area may be further defined by its location within the building, or the age of the material.

After homogeneous areas were identified, a sufficient number of samples were collected for submittal to the laboratory for polarized light microscopy ("PLM") analysis. Because asbestos containing materials have compositional variability, it is possible to obtain different results from samples taken from the same materials in the same building. Therefore, a homogeneous sampling area with at least one positive result will result in the entire area being designated as having asbestos containing material ("ACM").

The collection of bulk samples was based on the guidelines established by the EPA for school buildings in the Asbestos Hazard Emergency Response Act ("AHERA"), 40 CFR Part 763, EPA, 1987). In addition, the Asbestos Schools Hazard Re-authorization Act ("ASHARA") establishes guidelines for the inspection of commercial facilities. AHERA and ASHARA guidelines were used to insure the most reliable procedures for sample collection and reporting.

Standard sampling tools and procedures were used to obtain samples from the suspected materials. The samples were bagged and submitted to the laboratory under standard chain of custody protocols. Representative sample locations were noted on the floor plans of the building and are referenced on the chain of custody form from the laboratory, Micro Analytical Laboratories of Emeryville, California.

Laboratory Analysis
Laboratory analysis was based on polarized light microscopy supplemented by dispersion staining to observe asbestos mineral content. For the purposes of this survey, ACM is defined as any material containing more than 1% asbestos by weight, volume, or point count. For Cal/OSHA purposes, Asbestos Containing Construction Materials (ACCM) is defined as any material with greater than 0.1% asbestos.

IV. VISUAL SURVEY FINDINGS

On the morning of June 15, 2010, the inspection of the facility was performed, after a meeting with the County of Marin representatives. The inspection process was described and a brief walk-through was performed. Most of the spaces were accessible. The age of the building and the use of asbestos containing materials are usually related. Most buildings from the 1970's used asbestos in numerous applications. This building appears to have been remodeled in the past years, but is mostly intact from the original construction eras. The building is divided into the different components and their descriptions are provided below.

Walls and Structural Components

The building consists of concrete block exterior perimeter walls with wood framed interior walls and wood frame roof structure, using a concrete slab floor/foundation. The interior walls of the auditorium are sheathed in gypsum board, with a drywall joint compound applied at seams and corners. The interior ceilings consist of drywall and joint compounds, the same as the wall components. The ceiling above the auditorium has a heavy application of drywall texture. The ceiling above the stage is a smooth finish drywall. Limited areas of acoustic ceiling spray are found in the lobby of the theater.

Roofing Components

The main flat or low-sloped roof on the building consists of built up tar roof membranes, finished with a #90 mineral roll roof cap sheet. Plastic roof cement is used at penetrations, seams, and flashing locations.

Flooring Components

The flooring is assumed to be mostly carpet installed over wood or concrete subfloor. The floor materials are not in the scope of work and were not sampled for this report.

Mechanical Systems and Utilities

This category includes the HVAC, refrigeration systems, etc. Each of these systems uses different insulation materials, which are typically suspect for containing asbestos. The HVAC system consists of ceiling or roof-mounted units, with fiberglass insulation used on the interior of duct runs to the registers. The exterior duct work is sealed with a heavy caulking or roof cement at joints and seams.
Sampling of Building Materials

A total of twenty-two asbestos samples were collected from the representative building materials. Since no other suspect materials could be found, the sampling was considered complete. All of the samples were catalogued as to location, condition, and submitted for PLM analysis. The samples were hand-delivered to the laboratory using our standard chain of custody protocols on the morning of June 16, 2010.

During the inspection process, additional materials were noted that contain lead, which were not a specific part of this survey. All of the exterior paints on trim, soffits, etc. should be assumed to contain substantial amounts of lead. The lead suspect materials are in good condition. The ceramic tile materials used in various parts of the buildings may contain lead based glazing on some of the tiles. Any older copper water pipes may also contain lead containing solder at joints and fittings. This is only a partial list of the all the possible lead containing materials that may be present. The Cal/ OSHA and Department of Public Health regulations should be followed during demolition work.

During renovation work that will replace the lighting fixtures, the fluorescent lamps should be removed for recycling. All of the lighting fixtures should be examined for ballasts, which may contain PCBs. All PCB ballasts must be removed and disposed of following state and federal regulations.

V. CONCLUSIONS

Based on the visual inspection, sampling and laboratory analysis, the following results are noted:

• Drywall compound and texture samples produced positive results, at most of the locations sampled. A few of samples collected were non detect for asbestos. All of the wallboard materials in the main auditorium and stage should be considered as positive for more than 1% asbestos.

• The acoustic ceiling spray was non detect for asbestos.

• The built up tar and felt roof membranes were negative for asbestos content.

• The plastic roof cement was negative for asbestos.

• The exterior stucco / plaster was non detect for asbestos.

VI. RECOMMENDATIONS

Based on the visual inspection, sampling and laboratory analysis conducted, the following recommendations apply to the materials found on this site:

1. The drywall materials that were positive must be removed using abatement practices for greater than 1% asbestos, in the areas scheduled for renovation. All of the gypsum board assemblies are considered as asbestos containing material (“ACM”), requiring the use of contractors registered for asbestos related work. Any removal shall be performed using Wet methods, following all applicable regulatory guidelines. If additional information is required, please contact the author of this report for further details.
2. Renovation or demolition work in areas that are not specifically covered by this report shall be re-inspected prior to any disturbance of suspect materials. If the scope of work changes, please allow **24-48** hours notice for the inspector to perform additional survey work at the site.

3. Prior to removal or renovation of the buildings, all fluorescent light fixtures shall be opened to allow for removal of ballasts, which may contain PCB (see labels for content). All PCB ballasts and light tubes shall be collected, packaged, manifested, and recycled according to state regulations.

*Notify the asbestos consultant **24-48 hours** prior to start of any removal or abatement work to arrange for work monitoring and air sampling during the initial phase of the construction.* The construction manager of the project should verify that the abatement contractor is qualified to perform the work and understands the County of Marin’s specifications and restrictions for working on a public building. A pre job safety meeting is required. Any chemicals to be used on the project must be accompanied by a Materials Safety Data Sheet (“MSDS”) and appropriate hazard communication training for all employees at the site.

**VII. LIMITATIONS OF LIABILITY**

The work and resulting recommendations for this survey are in accordance with generally accepted building survey practices and the AHERA and ASHARA protocols for asbestos inspections. The report generators provide no other guarantees, either expressed or implied. Conclusions and recommendations presented in issued reports are qualitative judgments based on the prevailing regulations affecting the scope of this work at the time of the inspection of the particular building(s). The scope of work was limited to the visible and accessible parts of the building, limited sampling analysis, and data review. The client recognizes that site conditions or access may vary from those encountered at the time of the inspection, and that changing conditions may cause us to alter our recommendations. We have attempted to view as much of the building as possible, without opening hidden areas, removing all of the ceiling panels, or damaging existing property. If conditions or situations occur that expose these non-inspected areas, we will be glad to continue our inspection at that time for those locations.

This report is for the express use of the client for whom it was prepared, and is not intended for use by third parties. The authors of this report will not be responsible for interpretation or use by third parties of any of the information contained in this report. The building survey for asbestos is intended to provide an initial assessment of asbestos containing material at specific locations, and may not be valid at other locations or for other unique materials. Additional site evaluations could result in information that would lead us to revise our conclusions and recommendations. If any doubts exist, call for additional inspections or testing.

Respectfully submitted,

Monte Deignan
CAC 93-0879
The main ceiling above the stage is a smooth finished drywall. The joint compounds contain asbestos.

The ceiling above the main auditorium is gypsum board that is finished with a heavy spray-on texture. The texture layer contains asbestos.

The interior of the forced air ducts is lined with fiberglass.

The acoustic stucco ceiling is non-asbestos. The space above the ceiling uses fiberglass insulation.
The exterior stucco on the walls is non-asbestos.

The sheet metal ducts are lined with fiberglass insulation, based on visual inspection.

The caulking and sealants containing darker gray cements were non-asbestos.

The main roof is a #90 mineral surface built-up roof. No asbestos was found in the tar or the felts.
## Building Inspection Materials Listing

**Building / Unit / Functional Space:** County of Marin Exhibition Hall and Theater  |  San Rafael, CA  
**Job / Client:** County of Marin Public Works Capital Projects Group  
**Inspector and Date:** Monte Deignan  |  CAC 93-0879  |  June 15, 2010 - July 15, 2010  
**Project Manager:** Cam Isaza  

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<th>Material Description</th>
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<tr>
<td>SCT-01</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Control Room</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-02</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Control Room</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-03</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Control Room</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-04</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Entry Lobby</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-05</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Entry Lobby</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-06</td>
<td>Acoustic Ceiling Spray, White</td>
<td>Entry Lobby</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-07</td>
<td>Drywall Texture</td>
<td>Auditorium</td>
<td>Note 1</td>
<td>&lt;1% Chrysotile</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-07</td>
<td>Drywall Texture</td>
<td>Auditorium</td>
<td>Note 1</td>
<td>&lt;1% Chrysotile</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-09</td>
<td>Drywall Texture</td>
<td>Auditorium</td>
<td>Note 1</td>
<td>2% Chrysotile</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-10</td>
<td>Drywall Texture</td>
<td>Auditorium</td>
<td>Note 1</td>
<td>None Detected</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-11</td>
<td>Drywall Texture</td>
<td>Auditorium</td>
<td>Note 1</td>
<td>&lt;1% Chrysotile</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-12</td>
<td>Drywall Joint Compound</td>
<td>Stage</td>
<td>Note 1</td>
<td>&lt;1% Chrysotile</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
</tbody>
</table>

**Comments / Notes:**

Note 1: All of the drywall systems in the auditorium and stage use joint compounds containing asbestos. Point counting has not been performed, thus all of the joint compounds and textures should be treated as more than 1% asbestos and are listed as asbestos containing material (ACM).
<table>
<thead>
<tr>
<th>Sample #</th>
<th>Material Description</th>
<th>Locations</th>
<th>Area</th>
<th>% Asbestos</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT-13</td>
<td>Drywall Joint Compound</td>
<td>Stage</td>
<td>Note 1</td>
<td>None Detected</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-14</td>
<td>Drywall Joint Compound</td>
<td>Stage</td>
<td>Note 1</td>
<td>None Detected</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-15</td>
<td>Drywall Joint Compound</td>
<td>Stage</td>
<td>Note 1</td>
<td>None Detected</td>
<td>Follow Class II work practices if disturbed</td>
</tr>
<tr>
<td>SCT-16</td>
<td>Exterior Plaster, Tan</td>
<td>Walls at Roof</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-17</td>
<td>Exterior Plaster, Tan</td>
<td>Walls at Roof</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-18</td>
<td>#90 Roll Roof, Gray</td>
<td>Main Flat Roof</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-19</td>
<td>Roof Cements, Gray</td>
<td>Roof Seams</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCT-20</td>
<td>Roof Sealants, Gray</td>
<td>Flashings</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
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<tr>
<td>SCT-21</td>
<td>Roof Tar, Black</td>
<td>Flashings</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
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<tr>
<td>SCT-22</td>
<td>Duct Sealants, Gray</td>
<td>HVAC Ducts</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
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<tr>
<td>SCR-01</td>
<td>#90 Roll Roof, Gray</td>
<td>Control Booth</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
<tr>
<td>SCR-02</td>
<td>Tar on Wood Substrate</td>
<td>Control Booth</td>
<td>NA</td>
<td>None Detected</td>
<td>No asbestos regulations apply for this material</td>
</tr>
</tbody>
</table>

Comments / Notes:
The interior renovation work at the hallway / lounge will include installing a doorway through the wall. The wall material at the hallway appears to be wood siding or plywood. The wall at the existing lounge is gypsum board finished with joint compounds. Vinyl cove base is used at the floor next to the carpet floor covering. The hallway uses an acoustic plaster for the ceiling.

Photo 1 shows the hallway looking toward the rest rooms. The future doorway will be installed at the middle section of the photo. Photo 2 shows the interior of the lounge where the interior of the doorway will be placed. The drywall joint compound contains < 1% asbestos, based on the PLM lab results. Removal must be performed by asbestos abatement contractors.

The samples of the cove base, concrete block, mortar, acoustic ceiling, and plaster / stucco were non detect for asbestos. Refer to the attached lab report for specific details. Materials from other parts of the building may be different and the results may not be the same. Additional sampling is required for the same materials at other locations.
## MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084 Monte Deiagni
Monte Deiagni & Associates
P.O. Box 546
Larkspur, CA 94977

### PROJECT:
**EXHIBITION HALL AT MARIN CENTER**

<table>
<thead>
<tr>
<th>Client #</th>
<th>Sample Identification</th>
<th>Asbestos Information</th>
<th>Dominant Other Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MEH-01</strong></td>
<td>Micro # 225055-01, Analyst: MO</td>
<td><strong>DWARF WALL AND JOINT COMPOUND LOUNGE WALL AT WEST</strong>&lt;br&gt;<strong>JOINT COMPOUND (OLDER, BEIGE): &lt;1% CHrysotile&lt;br&gt;Joint Compound (NEWER, WHITE): NONE DETECTED&lt;br&gt;TAPE / PAINT: NONE DETECTED</strong>&lt;br&gt;(NO DRYWALL IN THE SAMPLE.)</td>
<td>10% CELLULOSE&lt;br&gt;NFM: CSYRNUM (CALCIUM SULFATE), CARBONATE.</td>
</tr>
<tr>
<td><strong>MEH-02</strong></td>
<td>Micro # 225055-02, Analyst: MO</td>
<td><strong>DWARF WALL AND JOINT COMPOUND LOUNGE WALL AT EAST</strong>&lt;br&gt;<strong>JOINT COMPOUND: &lt;1% CHrysotile ASBESTOS&lt;br&gt;TAPE / PAINT: NONE DETECTED</strong>&lt;br&gt;(NO DRYWALL IN THE SAMPLE.)</td>
<td>10% CELLULOSE&lt;br&gt;NFM: CARBONATE, MISC. PARTICLES</td>
</tr>
<tr>
<td><strong>MEH-03</strong></td>
<td>Micro # 225055-03, Analyst: MO</td>
<td><strong>DWARF WALL AND JOINT COMPOUND LOUNGE WALL AT CENTER</strong>&lt;br&gt;<strong>JOINT COMPOUND: NONE DETECTED&lt;br&gt;TAPE / PAINT: NONE DETECTED</strong>&lt;br&gt;(NO DRYWALL IN THE SAMPLE.)</td>
<td>2% CELLULOSE&lt;br&gt;NFM: CARBONATE, MISC. PARTICLES</td>
</tr>
<tr>
<td><strong>MEH-04</strong></td>
<td>Micro # 225055-04, Analyst: MO</td>
<td><strong>CONCRETE BLOCK LOUNGE AT SOUTH</strong>&lt;br&gt;<strong>CONCRETE: NONE DETECTED&lt;br&gt;PAINT: NONE DETECTED</strong></td>
<td>ROCK FRAGMENTS, CARBONATE, SIDERITE</td>
</tr>
<tr>
<td><strong>MEH-05</strong></td>
<td>Micro # 225055-05, Analyst: MO</td>
<td><strong>EXTERIOR STUCCO WEST SIDE ENTRY</strong>&lt;br&gt;<strong>STUCCO: NONE DETECTED&lt;br&gt;SIM COAT: NONE DETECTED&lt;br&gt;PAINT: NONE DETECTED</strong></td>
<td>ROCK FRAGMENTS, CARBONATE, SIDERITE</td>
</tr>
</tbody>
</table>

---

Technical Supervisor: [Signature] 10/8/2016

NVLAB Lab Code 101872-0, CA ELAP Certification #1037, Analyses use Polarized Light Microscopy (PLM), Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Insulation Samples (1992) and EPA-520/R-93-11b (1993). The 1992 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for insulated samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos fibers (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 um may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by other techniques such as Fiber Optic Raman Spectroscopy or Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties (transmission-asbestos or transmission electron microscopy). The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction materials is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analysis are recommended. Only dominant asbestos materials listed below can be detected by PLM. Interlayer contamination is possible among layers in a sample. Layers within a sample are separated by thin layers of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous materials. Sample heterogeneity is indicated by listing more than one distinct layer of asbestos. Analytical reports are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency.

5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824
## MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

**PROJECT:**
**EXHIBITION HALL**
**AT MARIN CENTER**

<table>
<thead>
<tr>
<th>Client #</th>
<th>MEH-06</th>
<th><strong>SAMPLE IDENTIFICATION</strong></th>
<th><strong>ASBESTOS INFORMATION</strong></th>
<th><strong>DOMINANT OTHER MATERIALS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro #: 225055-06</td>
<td>EXTERIOR STUCCO WEST SIDE ENTRY</td>
<td>Analyst: MO</td>
<td>STUCCO: NONE DETECTED</td>
<td>NFM: ROCK FRAGMENTS, CARBONATE, Binder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SKIM COAT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PAINT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td>Client #:</td>
<td>MEH-07</td>
<td>MICROSTRUC TION PLASTER DRINKING FOUNTAINS</td>
<td>PLASTER: NONE DETECTED</td>
<td>NFM: ROCK FRAGMENTS, CARBONATE, Binder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SKIM COAT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PAINT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td>Client #:</td>
<td>MEH-08</td>
<td>MICROSTRUC TION PLASTER DRINKING FOUNTAINS</td>
<td>PLASTER: NONE DETECTED</td>
<td>NFM: ROCK FRAGMENTS, CARBONATE, Binder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SKIM COAT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PAINT: NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td>Client #:</td>
<td>MEH-09</td>
<td>MICROSTRUC TION PLASTER DRINKING FOUNTAINS</td>
<td>COVE BASE: NONE DETECTED</td>
<td>NFM: SYNTHETIC MATERIAL, CARBONATE, Adhesive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MASTIC (BEIGE): NONE DETECTED</td>
<td></td>
</tr>
<tr>
<td>Client #:</td>
<td>MEH-10</td>
<td>MICROSTRUC TION PLASTER DRINKING FOUNTAINS</td>
<td>MORTAR: NONE DETECTED</td>
<td>NFM: ROCK FRAGMENTS, CARBONATE, Binder</td>
</tr>
</tbody>
</table>

Technical Supervisor: [Signature]

10/8/2016
### MICRO ANALYTICAL LABORATORIES, INC.
BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

### PROJECT:
EXHIBITION HALL
AT MARIN CENTER

<table>
<thead>
<tr>
<th>Client #</th>
<th>MEH-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro #</td>
<td>225055-11</td>
</tr>
<tr>
<td>Analyst</td>
<td>MO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASBESTOS INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUANTITY (AREA %) / TYPES / LAYERS / DISTINCT SAMPLES</td>
</tr>
</tbody>
</table>

**ACOUSTIC PLASTER: NONE DETECTED**

<table>
<thead>
<tr>
<th>DOMINANT OTHER MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFM: ROCK FRAGMENTS, CARBONATE, BINDER</td>
</tr>
</tbody>
</table>

---

Technical Supervisor: [Signature]
Gamini Ranatunga, Ph.D.
Date Reported: 10/8/2016

NVLAP Lab Code 101672-0, CA ELAP Certification #01037. Analyses use Polarized Light Microscopy (PLM), Micro Analytical SOP PLM-101. Basic techniques follow the EPA interim Method for Bulk Insulation Samples (1982) and EPA-600/R92.118 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NE-SHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of amphiboles (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos of actinolite-asbestos may be indistinguishable by PLM from some similar, non-regulated amphiboles (e.g., the "Libby Amphiboles" richterite and winchite), and should be confirmed by TEM. The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analysis are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to: cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASPBESTOS DETECTED" in a heterogeneous sample, or in any layers of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard/joint compound systems, composing is based on customers' descriptions of material as "joint compound," customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.
**Bulk Sample Log & Laboratory Request Form**

**Client:** County of Marin  
**City, State:** San Rafael, CA  
**Project:** Exhibition Hall@ Marin Center

**Collected By:** MD  
**Date:** October 6, 2016

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEH-01</td>
<td>DRYWALL &amp; JOINT COMPOUND</td>
<td>LOUNGE WALL @ WEST</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>MEH-02</td>
<td>DRYWALL &amp; JOINT COMPOUND</td>
<td>LOUNGE WALL @ EAST</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>MEH-03</td>
<td>DRYWALL &amp; JOINT COMPOUND</td>
<td>LOUNGE WALL @ CENTER</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MEH-04</td>
<td>CONCRETE BLOCK</td>
<td>LOUNGE @ SOUTH</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MEH-05</td>
<td>EXTERIOR STUCCO</td>
<td>WEST SIDE ENTRY</td>
<td></td>
<td>5</td>
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<tr>
<td>MEH-06</td>
<td>EXTERIOR STUCCO</td>
<td>WEST SIDE ENTRY</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>MEH-07</td>
<td>INTERIOR PLASTER</td>
<td>DRINKING FOUNTAINS</td>
<td></td>
<td>7</td>
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<tr>
<td>MEH-08</td>
<td>INTERIOR PLASTER</td>
<td>DRINKING FOUNTAINS</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>MEH-09</td>
<td>VINYL COVE BASE</td>
<td>HALLWAY</td>
<td></td>
<td>9</td>
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<tr>
<td>MEH-10</td>
<td>MORTAR</td>
<td>LOUNGE @ SOUTH</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

**Laboratory Name / Address:** Micro Analytical Lab  
5900 Hollis Street Suite M  
Emeryville, CA 94608

**Released By:** Monte Deignan  
**Transfered To:**  
**Received By:**  

10/8/16 10:11
**Bulk Sample Log & Laboratory Request Form**

**Client:** County of Marin  
**City, State:** San Rafael, CA  
**Project:** Exhibition Hall@ Marin Center  
**Collected By:** MD  
**Date:** October 6, 2016

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEH-11</td>
<td>Acoustic Plaster</td>
<td>Hallway Ceiling</td>
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<td>11</td>
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<tr>
<td>MEH-</td>
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<tr>
<td>MEH-</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name / Address:** Micro Analytical Lab  
5900 Hollis Street Suite M  
Emeryville, CA 94608

**Released By:** Monte Deignan  
**Transferred To:**  
**Received By:**  
10/8/16 10:11

Page 2 Of 2
March 14, 2017

Mr. Cam Isaza  
Capital Projects  
County of Marin  
3501 Civic Center Drive  
San Rafael, CA 94902

Asbestos Survey for Marin County Exhibit Hall Roof  
Rest Room Roof @ East  
10 Avenue of the Flags San Rafael, CA

I. INTRODUCTION
This report presents our limited inspection and bulk sampling for asbestos containing materials ("ACM") at the North lobby area of the Veterans Memorial Auditorium Avenue of the Flags San Rafael, California. The inspection was performed on March 13, 2017. The inspections at the site inspected and tested the flat roof, stucco, and roof sealants, which are scheduled for replacement. The remainder of the exhibit hall and auditorium was not inspected and results from this report should not be applied to other areas of the building. The primary purpose of this inspection is to identify materials, which contain asbestos, which must be removed prior to renovation of the structure. Our scope of work included an asbestos inspection consisting of visual inspection, bulk sampling, laboratory analysis, and the generation of the report findings. The inspection was performed by Mr. Monte Deignan, a Cal/OSHA certified asbestos consultant and AHERA accredited building inspector.

II. REGULATORY OVERVIEW
The following oversight agencies and regulations may affect the implementation of this project as described below:

Federal Agencies
Environmental Protection Agency ("EPA"), National Emission Standards for Hazardous Air Pollutants ("NESHAP") Notification 40 CFR 61 Part M
- Requires notification when removal or renovation involves greater than 160 square feet or 260 linear feet of friable asbestos containing materials

State Agencies/Regulations
Bay Area Air Quality Management District ("BAAQMD")
- Responsible for enforcement of the federal NESHAP regulations
- Requires notification for removal of all friable ACM if exceeding 100 square feet or linear feet
- Requires notification prior to demolition regardless of ACM amounts or presence
California Occupational Safety and Health Administration ("Cal/OSHA")
- Responsible for enforcement of Federal OSHA standards
- Requires friable and non-friable ACM exceeding 100 square feet to be removed by a registered Cal/OSHA asbestos abatement contractor
- Requires that contractors be licensed by the California Contractors State License Board ("CSLB")

AB 3713 Asbestos Notification Law (Connelley Act)
- Requires notification of tenants, employees, and co-owners about the presence and locations of ACM, and the potential health effects

Asbestos Real Estate Disclosure Law
- California state law requires the disclosure of ACM presence during real estate transactions.

III. ASBESTOS ANALYSIS PROCEDURES

Sampling Strategy
The objective of bulk sampling was to determine through laboratory analysis whether suspected materials at this site contain asbestos, and if so, what type and concentrations measured in percentages. Prior to the collection of any samples, all building materials were separated into distinct areas of homogeneity. A homogeneous area represents an area delineated by functional and visual similarity. The area may be further defined by its location within the building, or the age of the material.

After homogeneous areas were identified, a sufficient number of samples were collected for submittal to the laboratory for polarized light microscopy ("PLM") analysis. Because asbestos containing materials have compositional variability, it is possible to obtain different results from samples taken from the same materials in the same building. Therefore, a homogeneous sampling area with at least one positive result will result in the entire area being designated as having asbestos containing material ("ACM").

The collection of bulk samples was based on the guidelines established by the EPA for school buildings in the Asbestos Hazard Emergency Response Act ("AHERA"), 40 CFR Part 763, EPA, 1987). In addition, the Asbestos Schools Hazard Re-Authorization Act ("ASHARA") establishes guidelines for the inspection of commercial facilities. AHERA and ASHARA guidelines were used to insure the most reliable procedures for sample collection and reporting.

Standard sampling tools and procedures were used to obtain samples from the suspected materials. The samples were bagged and submitted to the laboratory under standard chain of custody protocols. Representative sample locations were noted on the floor plans of the building and are referenced on the chain of custody form from the laboratory, Micro Analytical Laboratories of Emeryville, California.
Laboratory Analysis
Laboratory analysis was based on polarized light microscopy supplemented by dispersion staining to observe asbestos mineral content. For the purposes of this survey, ACM is defined as any material containing more than 1% asbestos by weight, volume, or point count. For Cal/OSHA purposes, Asbestos Containing Construction Materials (ACCM) is defined as any material with greater than 0.1% asbestos.

IV. VISUAL SURVEY FINDINGS
On the afternoon of March 13, 2017, the inspection of the facility was performed, after a meeting with the County of Marin representatives. The inspection process was described and a brief walk-through was performed. All of the roof spaces were accessible. The age of the building and the use of asbestos containing materials are usually related. Most buildings from the 1960’s used asbestos in numerous applications. This building’s roof appears to have been patched or remodeled in the past years, but still contains some roofing from the original construction eras.

Walls and Structural Components
The building consists of concrete block exterior perimeter walls with a finish coating of exterior stucco. The roof structure is a wood roof deck supported by joists. The interior ceilings were not inspected for the scope of this survey.

Roofing Components
The main flat or low-sloped roof on the East Exhibit Hall roof consists of a built up tar and felt roofing. A mineral surface cap sheet finishes the roof exposed surface. A number of coatings or sealants have been used to solve a series of roof leaks. A thin layer of cellulose insulation is found below the layers of roofing. Fibered roof cement is used at penetrations, seams, and flashing locations.

Sampling of Building Materials
A total of ten asbestos samples were collected from the representative building materials. The samples were collect on March 13, 2017. Since no other suspect materials could be found, the sampling was considered complete. All of the samples were catalogued as to location, condition, and submitted for PLM analysis. The samples were hand-delivered to the laboratory using our standard chain of custody protocols on March 15, 2017.

During the inspection process, additional materials were noted that contain lead, which were not a specific part of this survey. All of the exterior paints on trim, soffits, etc. should be assumed to contain substantial amounts of lead. The lead suspect materials are in good condition. Any older copper water pipes may also contain lead containing solder at joints and fittings. This is only a partial list of the all the possible lead containing materials that may be present. The Cal/OSHA and Department of Health Services regulations should be followed during demolition work.

V. CONCLUSIONS
Based on the visual inspection, sampling and laboratory analysis, the following results are noted:
• All areas of gray or black colored roof cements are found to contain asbestos. If areas of gray or black cements are found below any roof materials, abatement of the cement portions will be required.
• The built up tar and felt roofing layers were non detect for asbestos.
• The roof insulation was non detect for asbestos.
• The exterior stucco was non detect for asbestos.

VI. RECOMMENDATIONS
Based on the visual inspection, sampling and laboratory analysis conducted, the following recommendations apply to the materials found on this site:

1. The roofing materials that were positive must be removed using roofing abatement practices for asbestos, in the areas scheduled for renovation. All of the roof cements are considered as asbestos containing material (“ACM”), due to the difficulty of separating and/or removing the asbestos containing mastic component. Any removal shall be performed by qualified abatement contractors, using Wet methods, following all applicable regulatory guidelines.

2. Renovation or demolition work in areas that are not specifically covered by this report shall be re-inspected prior to any disturbance of suspect materials. If the scope of work changes, please allow 24-48 hours notice for the inspector to perform additional survey work at the site.

Notify the asbestos consultant 24-48 hours prior to start of any removal or abatement work to arrange for work monitoring and air sampling during the initial phase of the construction. The construction manager of the project should verify that the abatement contractor is qualified to perform the work and understands the County of Marin’s specifications and restrictions for working on a public building. A pre job safety meeting is required. Any chemicals to be used on the project must be accompanied by a Materials Safety Data Sheet (“MSDS”) and appropriate hazard communication training for all employees at the site.

VII. LIMITATIONS OF LIABILITY
The work and resulting recommendations for this survey are in accordance with generally accepted building survey practices and the AHERA and ASHARA protocols for asbestos inspections. The report generators provide no other guarantees, either expressed or implied. Conclusions and recommendations presented in issued reports are qualitative judgments based on the prevailing regulations affecting the scope of this work at the time of the inspection of the particular building(s). The scope of work was limited to the visible and accessible parts of the building, limited sampling analysis, and data review. The client recognizes that site conditions or access may vary from those encountered at the time of the inspection, and that changing conditions may cause us to alter our recommendations. We have attempted to view as much of the building as possible, without opening hidden areas, removing all of the ceiling panels, or damaging existing property. If conditions or situations occur that expose these non-inspected areas, we will be glad to continue our inspection at that time for those locations.

This report is for the express use of the client for whom it was prepared, and is not intended for use by third parties. The authors of this report will not be responsible for interpretation or use by third parties of any of the information contained in this report. The building survey for asbestos is
intended to provide an initial assessment of asbestos containing material at specific locations, and may not be valid at other locations or for other unique materials. Additional site evaluations could result in information that would lead us to revise our conclusions and recommendations. If any doubts exist, call for additional inspections or testing.

Respectfully submitted,

Monte Deignan
CAC 93-0879
The exterior stucco on the wall is non-asbestos.

The caulking and sealants at the roof curbs contain dark gray cements that were found to contain 5% asbestos. All areas of gray or black roof cement must be treated as asbestos containing.

The main roof is a #90 roll roof. The roof consists of one layer. A layer of celotex insulation was found below the top roof layer. No asbestos was found in the multiple layers of tar, felts, or insulation materials. See the lab report for more information.
# Building Inspection Materials Listing

Marin Center Exhibit Hall East Roof  San Rafael, CA  
Date :  March 13, 2017  
Inspector:  Monte Deignan  CAC 93-0879  

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Material Description</th>
<th>Location</th>
<th>Area</th>
<th>% Asbestos</th>
<th>Recommendations</th>
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<tr>
<td>EHR-01</td>
<td>#90 Mineral Surf. Roof, Gray</td>
<td>Main Roof @ East</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
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<tr>
<td>EHR-02</td>
<td>#90 Mineral Surf. Roof, Gray</td>
<td>Main Roof @ North</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
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<tr>
<td>EHR-03</td>
<td>Roof Coating, White</td>
<td>Roof Parapet</td>
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<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
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<tr>
<td>EHR-04</td>
<td>Roof Coating, Gray</td>
<td>Roof- Wall Junction</td>
<td>Note 1</td>
<td>5% Chrysotile</td>
<td>Follow Class II ACM abatement regulations</td>
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<td>EHR-05</td>
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<td>Main Roof @ North</td>
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<td>Follow Class II ACM abatement regulations</td>
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<td>EHR-06</td>
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<td>Note 1</td>
<td>None Detected</td>
<td>Follow Class II ACM abatement regulations</td>
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<td>EHR-07</td>
<td>Patching Sealants, Tan / Blk.</td>
<td>Flashings @ South</td>
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<td>EHR-08</td>
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<td>Parapet @ South</td>
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<td>EHR-10</td>
<td>Caulking, Tan / Black</td>
<td>Parapet @ South</td>
<td>NA</td>
<td>None Detected</td>
<td>No abatement regulations apply to this material</td>
</tr>
</tbody>
</table>

**Comments / Notes :**

Note 1: The roof cements are found at scattered locations on roof jacks, patched areas, flashing, etc. All of the gray or black colored roof cements should be treated as ACM, since one or more samples are positive for asbestos.
# MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084
Monte Deiognan
Monte Deiognan & Associates
P.O. Box 546
Larkspur, CA 94977

<table>
<thead>
<tr>
<th>Client #</th>
<th>EHR-01</th>
<th>Micro #: 230321-01</th>
<th>Analyst: BK</th>
<th>TAR WITH GRAVEL: ND</th>
<th>FIBERGLASS FELT: ND</th>
<th>INSULATION: ND</th>
<th>25% CELLULOSE</th>
<th>5% FIBERGLASS GLASS</th>
<th>NFM: TARASPHALT, BINDERS</th>
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<td>Micro #: 230321-02</td>
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<td>INSULATION: ND</td>
<td>5% CELLULOSE</td>
<td>5% FIBERGLASS GLASS</td>
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<td>MASTIC RESIDUE (BLACK): 5% CHRYSOTILE ASBESTOS</td>
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<td>Micro #: 230321-05</td>
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<td>ND</td>
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Technical Supervisor: [Signature]

Gamini Ranatunga, Ph.D.

Date Reported: 3/15/2017

NVLAP Lab Code 101872-0. CA ELAP Certification #1037. Analyses use Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Insulation Samples (1982), and EPA-820/R23-116 (1986). The 1982 method covers all types of bulk materials, and is based on the 1982 Method with improved analytical techniques for layered samples as required for NEHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material-dependent. Detection of asbestos fibers (much less than 1%) may not be reliable or reproducible by PLM. Asbestos fibers with diameter below ~1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or actinolite-asbestos may be indistinguishable by PLM from some similar, non-asbestos fibers (e.g., Libby Amphiboles richterite and winchellite), and should be confirmed by TEM. The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal/OSHA definition of asbestos-containing construction materials is 0.1% asbestos, however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analysis are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported material other than asbestos, or for the absence of any non-asbestos material. Common interferents include, but are not limited to: cellulose, fiberglass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample homogeneity is indicated by listing more than one distinct layer of material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in a homogeneous sample, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; composting is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC): all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.
### MICRO ANALYTICAL LABORATORIES, INC.

BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

<table>
<thead>
<tr>
<th>SAMPLE IDENTIFICATION</th>
<th>QUANTITY (AREA %) / TYPES / LAYERS</th>
<th>ASBESTOS INFORMATION</th>
<th>DOMINANT OTHER MATERIALS</th>
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<td>Micro # 230321-06</td>
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<tr>
<td></td>
<td>ROOF CEMENT, GRAY ROOF CERAMIC...</td>
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<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PATCHING SEALANTS TAN/BLACK...</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FLASHING AT SOUTH</td>
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<td>Micro # 230321-08</td>
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<td>STUCCO: ND TEXTURE: ND PAINT: ND</td>
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<td></td>
<td>EXTERIOR STUCCO, TAN PARAPET AT SOUTH</td>
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<td>Micro # 230321-09</td>
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<tr>
<td></td>
<td>CAULKING, WHITE TAN/BLACK PARAPET AT SOUTH</td>
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NVLAP Lab Code 101572-0. CA ELAP Certification 01037. Analyses are made using Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Insulation Samples (1982), and EPA-800/R-93-116 (1993). The 1982 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (less than 1%) may not be reliably reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below 1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interference may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or amphibole-asbestos may be indistinguishable by PLM in some similar, non-regulated amphiboles (e.g., the "Libby Amphiboles" richterite and winchite), and should be confirmed by TEM. The lower quantification limit (reporting limit) of PLM estimation is 5%. The California OSHA definition of asbestos-containing construction materials is 0.1% asbestos; however, reliable determination of asbestos content at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analysis are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferes include, but are not limited to: cellulose, fiberglass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or material in the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND ("NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in a homogeneous sample, or in layers of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems: compositing is based on customers’ descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by the sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.

Technical Supervisor: Gamini Ranatunga, Ph.D.  3/15/2017

Date Reported: 5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824
# MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

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<th>EHR-11</th>
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</thead>
<tbody>
<tr>
<td>Micro #: 230321-11</td>
<td>STUCCO COATING, TAN</td>
</tr>
<tr>
<td>CMU WALL AT WEST</td>
<td>Analyst: BK</td>
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<tr>
<td>COATING: ND</td>
<td>PAINT: ND</td>
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<td>NFM: CARBONATE</td>
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<table>
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<td>Micro #: 230321-12</td>
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<td>CMU WALL AT NORTHWEST</td>
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<td>NFM: CARBONATE</td>
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**PROJECT:**
- EXHIBIT HALL
- REST ROOM ROOF

**Micro Log In:** 230321
- Total Samples: 12
- Date Sampled: 03/13/2017
- Date Received: 03/15/2017
- Date Analyzed: 03/15/2017

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NIELAP Lab Code 101872-0; CA ELAP Certification #1037. Analytical Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Insulation Samples (1992), and EPA-600/4-93-116 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos fibers (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below 1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or actinolite-asbestos may be indistinguishable by PLM from some similar, non-regulated amphiboles (e.g., the Libby Amphibole) nonactonite and wishonite, and should be confirmed by TEM. The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PLM Point Counting or TEM weight percent analysis are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to: cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in a homogenous sample, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard/joint compound systems, compositing is based on customers' descriptions of material as "joint compound." Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report shall not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.
<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
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<td>EHR-01</td>
<td>BUILT UP ROOF, GRAY CAP SHEET</td>
<td>EAST SIDE</td>
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<tr>
<td>EHR-06</td>
<td>ROOF CEMENT, GRAY</td>
<td>ROOF VENT CUFF</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>EHR-07</td>
<td>PARKING SEALANTS, TAN / BLACK</td>
<td>FLASHING @ SOUTH</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>EHR-08</td>
<td>EXTERIOR STUCCO, TAN</td>
<td>PARAPET @ SOUTH</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>EHR-09</td>
<td>EXTERIOR STUCCO, TAN</td>
<td>PARAPET @ EAST</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>EHR-10</td>
<td>CAULKING, WHITE/ TAN/ BLACK</td>
<td>PARAPET @ SOUTH</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Laboratory Name / Address: Microanalytical Lab Emeryville, CA

Released By: [Signature]  Transfered To:  Received By: [Signature] 3/15/17
# Bulk Sample Log & Laboratory Request Form

**Client:** County of Marin  
**Project:** Exhibit Hall Rest Room Roof  
**Collected By:** MD  
**Report To:** montedeignan@mac.com  
**Date:** March 13, 2017

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHR-11</td>
<td>STUCCO COATING, TAN</td>
<td>CMU WALLS WEST</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>EHR-12</td>
<td>STUCCO COATING, TAN</td>
<td>CMU WALLS NORTHWEST</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

**Laboratory Name / Address:** Microanalytical Lab Emeryville, CA

**Lab Client #:** 1084  
**Log In #:** 230321

**Analysis Requested:**  
- PLM  
- TEM  
- Pb  
- Misc.

**Rush:**  
- 24 Hr.  
- 3-5 Dy.

**Released By:** Mont Deignan  
**Received By:** Amy  
**Page:** 2  
**Date:** 3/15/17  
**Time:** 12:17
Previous reports have found some drywall samples to be non-detect for asbestos. Due to a number of positive drywall compound sample results, all of the gypsum board/drywall should be treated as asbestos containing materials (ACM).

The gypsum board ceilings are drywall applied over wood roof framing. The taping compounds contain from <1% to 3% asbestos. The ceiling is in good condition, with minor cracks at seams noted.

The acoustic ceiling panels are fiberglass, with a white finished surface. The acoustic panels are non-detect for asbestos.
County of Marin
Exhibit Hall
Asbestos Testing
Dec. 11, 2017

Monte Deignan & Associates
Certified Asbestos Consultants
Larkspur, CA

Legend of Materials
- Sample Site Site
- Positive sample
- Photo Site #

CEH-01
Drywall

CEH-02
Acoustic CP

CEH-03
Drywall

CEH-04
Drywall

CEH-05
Drywall

CEH-06
Acoustic CP

CEH-07
Drywall

CEH-08
Drywall

CEH-09
Drywall

CEH-10
Drywall

CEH-11
Drywall
County of Marin
Exhibit Hall
Asbestos Testing
Plan 2
Dec. 11, 2017

Monte Deignan & Associates
Certified Asbestos Consultants
Larkspur, CA

Legend of Materials

Sample Site Site
Positive sample

Photo Site #
<table>
<thead>
<tr>
<th>Client: EHR-01</th>
<th>TAR WITH GRAVEL: NONE DETECTED</th>
<th>20% FIBROUS GLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro: 93704-01 Analyst: KM PAK</td>
<td>FELT: NONE DETECTED</td>
<td>Matrix Type: ROOFING: TAR ETC.</td>
</tr>
<tr>
<td>#90 MINERAL SURFACE ROOF, GRAY</td>
<td>QC: A2</td>
<td></td>
</tr>
<tr>
<td>HVAC UNIT 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Client: EHR-02</th>
<th>TAR WITH SAND: NONE DETECTED</th>
<th>20% FIBROUS GLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro: 93704-02 Analyst: KM PAK</td>
<td>FELT: NONE DETECTED</td>
<td>Matrix Type: ROOFING: TAR ETC.</td>
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<tr>
<td>BUILT UP TAR &amp; FELT, BLACK</td>
<td>QC: R9</td>
<td></td>
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<tr>
<td>HVAC UNIT 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Client: EHR-03</th>
<th>NONE DETECTED</th>
<th>5% CELLULOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro: 93704-03 Analyst: KM PAK</td>
<td></td>
<td>Matrix Type: ROOFING: TAR ETC.</td>
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<tr>
<td>ROOF CEMENT, GRAY</td>
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<tr>
<td>HVAC UNIT 2</td>
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</table>

<table>
<thead>
<tr>
<th>Client: EHR-04</th>
<th>NONE DETECTED</th>
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<tbody>
<tr>
<td>Micro: 93704-04 Analyst: KM PAK</td>
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</tr>
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<td>CAULKING, LIGHT GRAY</td>
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<tr>
<td>HVAC UNIT 1</td>
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<table>
<thead>
<tr>
<th>Client: EHR-05</th>
<th>TAPE: NONE DETECTED</th>
<th>3% SYNTHETIC FIBERS</th>
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</thead>
<tbody>
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<td>Micro: 93704-05 Analyst: KM PAK</td>
<td>GLUE: NONE DETECTED</td>
<td>Matrix Type: GLUE</td>
</tr>
<tr>
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<td>QC: R8</td>
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</tr>
<tr>
<td>HVAC UNIT 2</td>
<td></td>
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Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM and should be confirmed by Transmission Electron Microscopy (TEM). The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PLM Point Counting or TEM is recommended. Only dominant non-asbestos materials are indicated. Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible; if asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) Codes: A1/A2 = results within acceptance limits, B = no asbestos in lab blank, R = resolved after review. Accreditation by NIST / NVLAP (Lab Code 101872-0), CA ELAP Certification #5057. EPA 1996 method is based on EPA Interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc., shall not be reproduced except in full, and pertains only to the samples analyzed. ND = NO ASBESTOS DETECTED.
### MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - PLM (EPA/600/R-93/116, 1993)**

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

---

**PROJECT:**
**EXHIBIT HALL ROOF PROJECT**

<table>
<thead>
<tr>
<th>Client</th>
<th>Micro</th>
<th>Analyst</th>
<th>ASBESTOS INFORMATION</th>
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<tbody>
<tr>
<td>EHR-06</td>
<td>93704-06</td>
<td>KM PAK</td>
<td>TAR (BLACK): NONE DETECTED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TAR (GRAY): 10% CHRYSOTILE</td>
</tr>
<tr>
<td>EHR-07</td>
<td>93704-07</td>
<td>KM PAK</td>
<td>TAR WITH GRAVEL: NONE DETECTED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FELT: NONE DETECTED</td>
</tr>
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<td></td>
<td>TAR: NONE DETECTED</td>
</tr>
<tr>
<td>EHR-08</td>
<td>93704-08</td>
<td>KM PAK</td>
<td>TAR: NONE DETECTED</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>FELT: NONE DETECTED</td>
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<tr>
<td>EHR-09</td>
<td>93704-09</td>
<td>KM PAK</td>
<td>NONE DETECTED</td>
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<tr>
<td>EHR-10</td>
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<td>KM PAK</td>
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**ASBESTOS INFORMATION**

**DOMINANT OTHER MATERIALS**

<table>
<thead>
<tr>
<th>Client</th>
<th>Micro</th>
<th>Analyst</th>
<th>ASBESTOS INFORMATION</th>
<th>QTY / TYPE / LAYERS / DISTINCT SAMPLES</th>
<th>DOMINANT OTHER MATERIALS</th>
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<td>EHR-06</td>
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<td>TAR (BLACK): NONE DETECTED</td>
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<td>Matrix: ROOFING: TAR ETC.</td>
<td>QC: A2</td>
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---

**Technical Supervisor:** Baojia Ke, Ph. D.

**Date Reported:** 4/2/2007

---

Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. The Car-O-SHA definition of asbestos-containing construction material is 0.1% asbestos; however, for this report, asbestos percent at this level cannot be done by PLM alone. Only dominant non-asbestos materials are indicated, interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible. If asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as “joint compound”. Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC Codes: A1/A2 = results within acceptance limits; B = no asbestos in lab blank; R = resolved after review. Accreditation by NIST / NVLAP (Lab Code 101872-0). CA ELAP Certification #1037. EPA 1993 method is based on EPA interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc. shall not be reproduced except in full, and pertains only to the samples analyzed. NO = NO ASBESTOS DETECTED.

---

5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824
### SAMPLE IDENTIFICATION

<table>
<thead>
<tr>
<th>Client</th>
<th>Micro: 93704-11</th>
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<tr>
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<td>93704-11</td>
<td>#50 MINERAL SURFACE, ROOF GRAY</td>
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<td>VC UNIT A</td>
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<table>
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<tr>
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<td>VC UNIT A</td>
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<th>Analyst: KM PAK</th>
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<td>93704-14</td>
<td>ROOFING TAR, BLACK</td>
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<table>
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<tr>
<td></td>
<td>93704-15</td>
<td>DUCT CAULKING, BEIGE</td>
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<td>VC UNIT B</td>
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### ASBESTOS INFORMATION

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<th>Project: EXHIBIT HALL ROOF PROJECT</th>
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<table>
<thead>
<tr>
<th>Client</th>
<th>Sample Description</th>
<th>Fibers Detected</th>
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</thead>
<tbody>
<tr>
<td>EHR-11</td>
<td>TAR WITH GRAVEL: NONE DETECTED, FELT: NONE DETECTED, TAR: NONE DETECTED</td>
<td>10% FIBROUS GLASS</td>
</tr>
<tr>
<td>EHR-12</td>
<td>TAR: NONE DETECTED, FELT: NONE DETECTED</td>
<td>15% FIBROUS GLASS</td>
</tr>
<tr>
<td>EHR-13</td>
<td>ROOF CEMENT (WHITE): NONE DETECTED, ROOF CEMENT (BLACK): NONE DETECTED</td>
<td>5% CELLULOSE</td>
</tr>
<tr>
<td>EHR-14</td>
<td>NONE DETECTED</td>
<td>2% FIBROUS GLASS</td>
</tr>
<tr>
<td>EHR-15</td>
<td>NONE DETECTED</td>
<td>CARBONATE</td>
</tr>
</tbody>
</table>

### DOMINANT OTHER MATERIALS

- **Type:** ROOFING: TAR ETC.
- **QC:** A2

### Technical Supervisor:

Baojia Ke, Ph. D.  Date Reported: 4/2/2007

---

Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). The lower quantification limit (reporting limit) of PLM estimation is 1%. The Cal/OSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation; PLM Point Counting or TEM is recommended. Only dominant non-asbestos materials are indicated. Interferences may prevent detection of small asbestos fibers, and hence determination of some optical properties. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. Layers are analyzed separately when feasible, if asbestos is detected, asbestos percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. Composite asbestos percentages are applicable only to wallboard / joint compound systems; composting is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC) Codes: A1A2 - results within acceptance limits, B = no asbestos in lab blank; B = resolved after review. Accreditation by NIST / NVLAP (Lab Code 101672-0). CA CLAP Certification #2037. EPA 1993 method is based on EPA Interim Method (1982), with improved analytical techniques. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced without the approval of Micro Analytical Laboratories, Inc., shall not be reproduced except in full, and pertain only to the samples analyzed. ND = NO ASBESTOS DETECTED.
<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHR-01</td>
<td>#90 Mineral Surface Roof,</td>
<td>HVAC UNIT 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-02</td>
<td>Built Up Tar &amp; Felt,</td>
<td>HVAC UNIT 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td></td>
<td></td>
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<tr>
<td>EHR-03</td>
<td>Roof Cement, Gray</td>
<td>HVAC UNIT 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-04</td>
<td>Caulking, Light Gray</td>
<td>HVAC UNIT 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-05</td>
<td>Duct Tape, White</td>
<td>HVAC UNIT 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-06</td>
<td>Tar, Black</td>
<td>HVAC UNIT 3</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Flashing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-07</td>
<td>#90 Mineral Surface Roof,</td>
<td>HVAC UNIT 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gray</td>
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<td></td>
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<tr>
<td>EHR-08</td>
<td>Built Up Tar &amp; Felt,</td>
<td>HVAC UNIT 4</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td></td>
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<tr>
<td>EHR-09</td>
<td>Roof Tar, Black</td>
<td>HVAC UNIT 4,</td>
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<tr>
<td></td>
<td>From Older Roof</td>
<td>HVAC UNIT 5</td>
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<tr>
<td>EHR-10</td>
<td>Roof Cement, Gray</td>
<td>HVAC UNIT 2</td>
<td></td>
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</tr>
</tbody>
</table>
# Bulk Sample Log & Laboratory Request Form

**Client:** County of Marin Public Works  
**City, State:** San Rafael, CA 94901  
**Phone:**  
**Contact:**  
**Project Name / Site:** Exhibit Hall Roof Project  
**Collected By:** MD  
**Report To:** MD  
**Date:** 03-23-07

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHR-11</td>
<td>#30 MINERAL SURFACE, ROOF GRAY</td>
<td>HVAC UNIT A</td>
<td></td>
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</tr>
<tr>
<td>EHR-12</td>
<td>BUILT UP TAR &amp; FELT, BLACK</td>
<td>HVAC UNIT A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-15</td>
<td>ROOF CEMENT, BLACK/WHITE</td>
<td>HVAC UNIT A</td>
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<td></td>
</tr>
<tr>
<td>EHR-14</td>
<td>ROOFING TAR, BLACK</td>
<td>HVAC UNIT A</td>
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<tr>
<td>EHR-15</td>
<td>DUCT CAULKING, BEIGE</td>
<td>HVAC UNIT B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHR-15</td>
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<td></td>
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</tr>
<tr>
<td>EHR-15</td>
<td></td>
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</tbody>
</table>

**Laboratory Name / Address:** Micro Analytical Lab  
5900 Hollis Street Suite M  
Emeryville, CA 94608

**Released By:** Monte Deignan  
**Transferred To:**  
**Received By:**
## MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084 Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

### PROJECT:
**MARIN CENTER EXHIBIT HALL**
(Report amended 12/18/2017. Results changed after Reanalysis of Sample NO. CEH-04. Replaces report of 12/14/17)

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Client #</th>
<th>Type</th>
<th>Asbestos Information</th>
<th>Dominant Other Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CEH-01</strong></td>
<td>Micro # 240210-01</td>
<td>DRYWALL, JOINT TAPE CEILING AT EH EAST SIDE</td>
<td>JOINT COMPOUND: 2% CHRYSOTILE ASBESTOS TAPE / PAINT: ND</td>
<td>15% CELLULOSE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(NO DRYWALL IN THE SAMPLE.)</td>
<td>NFM: SYNTHETIC MATERIAL, CARBONATE</td>
</tr>
<tr>
<td><strong>CEH-02</strong></td>
<td>Micro # 240210-02</td>
<td>ACOUSTIC CEILING PANEL CEILING AT EH EAST SIDE</td>
<td>ACOUSTIC CEILING: ND WHITE COVERING / PAINT: ND</td>
<td>3% CELLULOSE 85% FIBROUS GLASS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NFM: GLASS FRAGMENTS SYNTHETIC MATERIAL</td>
</tr>
<tr>
<td><strong>CEH-03</strong></td>
<td>Micro # 240210-03</td>
<td>DRYWALL, JOINT TAPE CEILING AT EH EAST SIDE</td>
<td>COMPOSITE DW &amp; JC: &lt;1% CHRYSOTILE ASBESTOS DRYWALL: ND JOINT COMPOUND: 3% CHRYSOTILE ASBESTOS TAPE / PAINT: ND</td>
<td>10% CELLULOSE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NFM: &quot;GYPSPUM (CALCUL SULFATE) SYNTHETIC MATERIAL</td>
</tr>
<tr>
<td><strong>CEH-04</strong></td>
<td>Micro # 240210-04</td>
<td>DRYWALL, JOINT TAPE CEILING AT EH EAST SIDE</td>
<td>JOINT COMPOUNDS (WHITE): 3% CHRYSOTILE ASBESTOS JOINT COMPOUNDS (OFF-WHITE): ND TAPE / PAINT: ND</td>
<td>20% CELLULOSE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>INSUFFICIENT DRYWALL FOR ANALYSIS</td>
</tr>
<tr>
<td><strong>CEH-05</strong></td>
<td>Micro # 240210-05</td>
<td>DRYWALL, JOINT TAPE CEILING AT EH EAST SIDE</td>
<td>DRYWALL: ND JOINT COMPOUNDS: ND TAPE / PAINT: ND</td>
<td>&lt;1% WOLLASTONITE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NFM: &quot;GYPSPUM (CALCUL SULFATE), CARBONATE</td>
</tr>
</tbody>
</table>

Technical Supervisor: Garnini Ranatunga, Ph.D. 12/18/2017

NVLAP Lab Code 101672-3. CA ELAP Certification #1037. Analyses use Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Insulation Samples (1982), and EPA-600/422-116 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible. PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 um may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by X-ray diffraction or TEM. Interferences can prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or actinolite-asbestos may be indistinguishable by PLM from some similar, non-regulated amphiboles (e.g. the "Libby Amphiboles" richterite and winchite), and should be confirmed by TEM.

The lower quantification limit (reporting limit) of PLM estimation is 1%. The CA-OHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analysis are recommended. Only Dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to, cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Samples heterogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among layers in a sample. The notation ND (of "NO DETECTED") indicates a result of "NO ASPBESTOS DETECTED" in a homogeneous sample, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; composting is based on customers’ descriptions of material as "joint compound". Customers are solely responsible for description and collection of bulk materials listed or field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC): all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.

5900 HOLLIS STREET, SUITE M - EMERYVILLE, CA 94608 - (510) 653-0824
## MICRO ANALYTICAL LABORATORIES, INC.

**BULK ASBESTOS ANALYSIS - POLARIZED LIGHT MICROSCOPY (PLM)**

1084
Monte Deignan
Monte Deignan & Associates
P.O. Box 546
Larkspur, CA 94977

**PROJECT:**
MARIN CENTER
EXHIBIT HALL

(Report amended 12/18/2017. Results changed after Reanalysis of Sample ND, CEH-04. Replaces report of 12/14/17)

**Micro Log In:**

<table>
<thead>
<tr>
<th>Total Samples</th>
<th>14</th>
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<tbody>
<tr>
<td>Date Sampled</td>
<td>12/11/2017</td>
</tr>
<tr>
<td>Date Received</td>
<td>12/12/2017</td>
</tr>
<tr>
<td>Date Analyzed</td>
<td>12/12/2017</td>
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### SAMPLE IDENTIFICATION

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-06</th>
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</thead>
<tbody>
<tr>
<td><strong>Micro #: 240210-06</strong></td>
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</tr>
</tbody>
</table>
ACOUSTIC CEILING PANEL
CEILING AT EH WEST SIDE |
| Analyst | GR |
| QUANTITY (AREA %) / TYPES / LAYERS | ACOUSTIC CEILING: ND
WHITE COVERING / PAINT: ND |
| ASBESTOS INFORMATION | ND = NO ASBESTOS DETECTED |
| DOMINANT OTHER MATERIALS | 3% CELLULOSE
85% FIBROUS GLASS |
| NFM. | GLASS FRAGMENTS
SYNTHETIC MATERIAL |

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-07</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Micro #: 240210-07</strong></td>
<td></td>
</tr>
</tbody>
</table>
DRYWALL, JOINT TAPE
CEILING AT EH WEST SIDE |
| Analyst | GR |
| COMPOSITE DW & JC: | <1% CHRYSOTILE ASBESTOS |
| DRYWALL: ND |
| JOINT COMPOUND: <1% CHRYSOTILE ASBESTOS |
| TAPE / PAINT: ND |
| 20% CELLULOSE |
| NFM. | DYSPARUS (CALCULSULFATE), CARBONATE |

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Micro #: 240210-08</strong></td>
<td></td>
</tr>
</tbody>
</table>
DRYWALL, JOINT TAPE
CEILING AT EH WEST SIDE |
| Analyst | GR |
| COMPOSITE DW & JC: | <1% CHRYSOTILE ASBESTOS |
| DRYWALL: ND |
| JOINT COMPOUND: <1% CHRYSOTILE ASBESTOS |
| TAPE / PAINT: ND |
| 20% CELLULOSE |
| NFM. | DYSPARUS (CALCULSULFATE), CARBONATE |

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-09</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Micro #: 240210-09</strong></td>
<td></td>
</tr>
</tbody>
</table>
DRYWALL, JOINT TAPE
UPPER WALL AT SHOP SPACE |
| Analyst | GR |
| DRYWALL: ND |
| JOINT COMPOUNDS: ND |
| TAPE / PAINT: ND |
| 25% CELLULOSE |
| <1% WOLLASTONITE |
| NFM. | DYSPARUS (CALCULSULFATE), CARBONATE |

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Micro #: 240210-10</strong></td>
<td></td>
</tr>
</tbody>
</table>
DRYWALL, JOINT TAPE
CEILING AT STORAGE |
| Analyst | GR |
| DRYWALL: ND |
| JOINT COMPOUND: ND |
| PAINT: ND |
| 20% CELLULOSE |
| 3% FIBROUS GLASS |
| NFM. | DYSPARUS (CALCULSULFATE), CARBONATE |

---

Technical Supervisor: [Signature]

Gemini Ranatunga, Ph.D.

Date Reported: 12/18/2017

NVLAP Lab Code 101872-0. CA ELAP Certification #1037. Analyses use Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA interim Method for Bulk Insulation Samples (1982), and EPA-600/290-118 (1990). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NESHAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight 1% cannot be determined by PLM. Asbestos with diameter below ~1 μm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively determined by PLM, and should be confirmed by Transmission Electron Microscopy (TEM) interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or actinoite-asbestos may be indistinguishable by PLM from some similar non-regulated amphiboles (e.g., the "Libby Amphiboles" richterite and winchite), and should be confirmed by TEM. The lower quantification limit (reporting limit) of PLM estimation is 1%. The CIA-CSHA definition of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analyses are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to: cellulose, florioucous, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible. If asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in a homogenous sample, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; composting is based on customers’ descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC): all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency.

This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.
**Micro Analytical Laboratories, Inc.**

**Bulk Asbestos Analysis - Polarized Light Microscopy (PLM)**

**Project:**

**Marin Center Exhibit Hall**

(Report amended 12/18/2017. Results changed after reanalysis of sample No. CEH-04. Replaces report of 12/14/17)

**Micro Log In:** 240210

**Total Samples:** 14

**Date Sampled:** 12/11/2017

**Date Received:** 12/12/2017

**Date Analyzed:** 12/12/2017

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**Sample Identification**

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<th>Client #:</th>
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<tbody>
<tr>
<td><strong>Micro #:</strong> 240210-11</td>
<td><strong>Analyst:</strong> GR</td>
</tr>
<tr>
<td><strong>Type:</strong> DRYWALL, COMPOUND AND TAPE CEILING AT STORAGE</td>
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</table>

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-12</th>
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</thead>
<tbody>
<tr>
<td><strong>Micro #:</strong> 240210-12</td>
<td><strong>Analyst:</strong> GR</td>
</tr>
<tr>
<td><strong>Type:</strong> MASTIC, TAN FAN ROOM AT VMA NORTH SIDE</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Client #:</th>
<th>CEH-13</th>
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</thead>
<tbody>
<tr>
<td><strong>Micro #:</strong> 240210-13</td>
<td><strong>Analyst:</strong> GR</td>
</tr>
<tr>
<td><strong>Type:</strong> DRYWALL COMPOUND AND TAPE FAN ROOM AT VMA NORTH SIDE</td>
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<table>
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<th>CEH-14</th>
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<tbody>
<tr>
<td><strong>Micro #:</strong> 240210-14</td>
<td><strong>Analyst:</strong> GR</td>
</tr>
<tr>
<td><strong>Type:</strong> INTERIOR PLASTER, TAN FAN ROOM AT VMA SOUTH SIDE</td>
<td></td>
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**Quantity (Area %) / Types / Layers**

<table>
<thead>
<tr>
<th>ND = NO ASBESTOS DETECTED</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Asbestos Information</strong></th>
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<table>
<thead>
<tr>
<th><strong>Dominant Other Materials</strong></th>
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<table>
<thead>
<tr>
<th><strong>CEH-11</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D RYW A L L:</strong> ND</td>
</tr>
<tr>
<td><strong>J OINT COMPOUND:</strong> ND</td>
</tr>
<tr>
<td><strong>T APE / PAINT:</strong> ND</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>25 % CELLULOSE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 % FIBROUS GLASS</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CEH-12</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M ASTIC TAN:</strong> ND</td>
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</table>

<table>
<thead>
<tr>
<th><strong>CEH-13</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C OMP OSITE DW &amp; JC:</strong> &lt;1% CHRYSOTILE ASBESTOS</td>
</tr>
<tr>
<td><strong>D RYWALL:</strong> ND</td>
</tr>
<tr>
<td><strong>J OINT COMPOUND:</strong> &lt;1% CHRYSOTILE ASBESTOS</td>
</tr>
<tr>
<td><strong>T APE / PAINT:</strong> ND</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>40 % CELLULOSE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;1 % WOLLastonite</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CEH-14</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P LASTER:</strong> ND</td>
</tr>
</tbody>
</table>

| **G YPS UM (C ALC U M S UFL ATE), CARBO NAT E** |

---

**Technical Supervisor:** [Signature]

**Date Reported:** 12/18/2017

---

**NLAP Lab Code:** 101972-0. CA ELAP Certification #1037. Analyses use Polarized Light Microscopy (PLM). Micro Analytical SOP PLM-101. Basic techniques follow the EPA Interim Method for Bulk Materials (1982) and EPA-600/85-118 (1993). The 1993 method covers all types of bulk materials and is based on the 1982 Method, with improved analytical techniques for layered samples as required for NHERAP compliance. Asbestos is quantified by calibrated visual estimation. Detection limit is material dependent. Detection of asbestos traces (much less than 1%) may not be reliable or reproducible by PLM. Weight % cannot be determined by PLM. Asbestos with diameter below ~1 µm may not be detected by PLM. Absence of asbestos in dust, debris, and some compact materials, including floor tiles, cannot be conclusively established by PLM, and should be confirmed by Transmission Electron Microscopy (TEM). Interferences may prevent detection of small asbestos fibers, and hinder determination of some optical properties. Tremolite-asbestos or actinolite asbestos may be indistinguishable by PLM from some similar, non-regulated amphiboles (e.g., the "Libby Amphiboles" crocinite and white crocinite), and should be confirmed by TEM. The lower quantitation limit (reporting limit) of PLM estimation is 1%. The Cal-OSHA estimation of asbestos-containing construction material is 0.1% asbestos; however, reliable determination of asbestos percent at this level cannot be done by PLM estimation. PLM Point Counting or TEM weight percent analyses are recommended. Only dominant non-asbestos materials (fibrous and non-fibrous) are listed. This analysis shall not be construed as conclusive for the presence of any reported materials other than asbestos, or for the absence of any non-asbestos material. Common interferences include, but are not limited to: cellulose, fibrous glass, other man-made vitreous fibers, synthetic fibers, elongate fragments of calcium sulfate, talc, wollastonite, animal hair, and other miscellaneous elongate particles. Sample heterogeneity is indicated by listing more than one distinct layer or material on the report. If more than one distinct sample is received in the same container, samples shall be marked with letters and analyzed separately. Layers within a sample are analyzed separately when feasible; if asbestos is detected, percentages are reported for individual layers. Interlayer contamination is possible among any layers in a sample. The notation ND (or "NONE DETECTED") indicates a result of "NO ASBESTOS DETECTED" in homogeneous samples, or in a layer of a heterogeneous sample. Composite asbestos percentages from multiple layers are applicable only to wallboard / joint compound systems; compositing is based on customers' descriptions of material as "joint compound". Customers are solely responsible for identification and description of bulk materials listed on field forms. Laboratory descriptions may differ from those given by customers. Quality Control (QC): all results have been determined to be within acceptance limits prior to reporting. Reanalyzed samples are denoted by two sets of analyst initials. Unless otherwise stated herein, all samples were received in acceptable condition for analysis. This report must not be used to claim product endorsement by NIST or any U.S. Government agency. This report shall not be reproduced except in full, without the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed. NFM = Non-fibrous materials.

**5900 Hollis Street, Suite M - Emeryville, CA 94608 - (510) 653-0824**
# Bulk Sample Log & Laboratory Request Form

**Client:** County of Marin  
Public Works - Capital Projects

**Project:** Marin Center Exhibit Hall

**Collected By:** MD  
**Report To:** montedeignan@mac.com  
**Date:** Dec. 11, 2017

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEH-01</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH EAST SIDE</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CEH-02</td>
<td>Acoustic Ceiling Panel</td>
<td>CEILING C &amp; EH EAST SIDE</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>CEH-03</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH EAST SIDE</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CEH-04</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH EAST SIDE</td>
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<td>4</td>
</tr>
<tr>
<td>CEH-05</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH EAST SIDE</td>
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<tr>
<td>CEH-06</td>
<td>Acoustic Ceiling Panel</td>
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<tr>
<td>CEH-07</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH WEST SIDE</td>
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<td>CEH-08</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; EH WEST SIDE</td>
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<td>8</td>
</tr>
<tr>
<td>CEH-09</td>
<td>DRYWALL, JOINT TAPE</td>
<td>UPPER WALL 0 STOP SPACE</td>
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<td>9</td>
</tr>
<tr>
<td>CEH-10</td>
<td>DRYWALL, JOINT TAPE</td>
<td>CEILING C &amp; SPACENOISE</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

**Laboratory Name / Address:** Microanalytical Lab Emeryville, CA

**Released By:** [Signature]  
**Transferred To:**  
**Received By:** [Signature]  
**Page:** 1  
**Of:** 2
## Bulk Sample Log & Laboratory Request Form

**Client:** County of Marin  
Public Works - Capital Projects  

**Project:** Marin Center Exhibit Hall  

**Collected By:** MD  
**Report To:** montedeignan@mac.com  
**Date:** Dec. 11, 2017

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Description</th>
<th>Sample Location</th>
<th>Notes</th>
<th>Lab #</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEH-11</td>
<td>DRYWALL COMPOUND + TAPE</td>
<td>CEILING @ STORAGE</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>CEH-12</td>
<td>MASTIC, TAN</td>
<td>FAN ROOM @ VMA NORTH SIDE</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>CEH-13</td>
<td>DRYWALL COMPOUND + TAPE</td>
<td>FAN ROOM @ VMA NORTH SIDE</td>
<td></td>
<td>13</td>
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<tr>
<td>CEH-14</td>
<td>INTERIOR PLASTER, TAN</td>
<td>FAN ROOM @ VMA SOUTH SIDE</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

**Laboratory Name / Address:** Microanalytical Lab Emeryville, CA

**Released By:**  
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MEMORANDUM
DEPARTMENT OF PUBLIC WORKS

Effective Date: April 1, 2020

COVID-19 Construction Field Safety Guidance

It is important to note that implementation of this guidance is within each contractor's means and methods and not a direction from County of Marin related to any specific project.

This field guidance has been developed in response to the need for work on certain construction projects to continue as safely as possible while various COVID-19 self-isolation orders are in place within the state of California. The State of California and County of Marin Health Orders that address the COVID-19 pandemic provide for certain work on public works projects to continue if it is Essential Infrastructure or an Essential Governmental Function as defined under the Marin County Health Order dated March 31, 2020 (Health Order).

This guidance is not all encompassing and may need to be tailored for individual construction sites, particularly smaller sites using their own workforce. But they provide best practices to provide safe work sites in light of the challenges posed by COVID-19. This guidance may be updated as more information becomes available regarding COVID-19 and potential exposure pathways.

Contractors should prepare a new or updated Site-Specific Health and Safety Plan to address COVID-19-related issues and are strongly urged to adopt and implement measures that address such issues as but not limited to the following: assembly points; daily screening protocols; site protocols to mitigate potential spread; designation of a Site Safety Representative (SSR); providing sufficient levels of PPE to workers; social distancing - especially in tight or limited work areas; cleaning and decontamination protocols; adequate hand washing stations; and COVID-19 awareness training as part of weekly tailgate meetings.

Also, contractors should review the latest OSHA COVID-19 Workplace Safety Guidance document¹ as a resource in preparation of their Site-Specific Health and Safety Plan. A copy of the Contractor's Site-Specific Health and Safety Plan shall be kept at the jobsite and made available at all times.

The authority of the Engineer and the duly authorized Inspectors described in the General Conditions includes the authority to suspend the work if contractor personnel are not complying with the Health Order and/or OSHA guidance.

¹ see https://www.osha.gov/Publications/OSHA3990.pcf