PROJECT MANUAL

for;

Saddleback College Health Sciences Building
I.T. Server Room Renovation Project

South Orange County Community College District
28000 Marguerite Parkway
Mission Viejo, CA 92692-3635

Prepared By:

R²A Architecture
2900 Bristol Street, Suite E-205
Costa Mesa, CA 92626
(714) 435-0380

Project Number 9017.00
04.20.10

BID No. 1097
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ARCHITECT

R²A Architecture
2900 Bristol Street, Suite E-205
Costa Mesa, CA 92626-7909
P: (714) 435-0380
F: (714) 435-0383

License: 30207558 Etienne G. Runge

Health Sciences Building - I.T. Server Room Renovation Project
Saddleback College
South Orange County Community College District
Seals Page

STRUCTURAL ENGINEER

KNA Consulting Engineers, Inc.
9931 Muirlands Boulevard
Irvine, CA 92618
P: (949) 462-3200
F: (949) 462-3201

License: 2553 David R. Nelson
MECHANICAL ENGINEER

Tsuchiyama Kaino Sun and Carter
17911 Von Karman Avenue, Suite 250
Irvine, CA 92614
P: (949) 756-0565
F: (949) 756-0927

License: 25633 Larry Sun
Seals Page

ELECTRICAL ENGINEER

Konsortum
1532 E. Warner Avenue
Santa Ana, CA 92705
P: (714) 668-4200
F: (714) 668-4215

License: 15610 Raymond W. Swartz
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# BID DOCUMENTS

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NOTICE CALLING FOR BIDS

District: SOUTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT

Project: BID NO. 1097: I.T. Server Room Renovation at Saddleback College

Bid Deadline: 2:00 P.M., July 7, 2010

Mailing Address & Place of Bid Receipt:
South Orange County Community College District
Health Sciences Building, 3rd Floor, Room HS-357
Purchasing & Facilities Planning Department
28000 Marguerite Parkway
Mission Viejo, CA 92692

NOTICE IS HEREBY GIVEN that the South Orange County Community College District, of Orange County, California, acting by and through its Governing Board, hereinafter referred to as "DISTRICT," will receive up to, but not later than, the above-stated time, sealed bids for the award of a contract for the above Project.

Project’s Preliminary Cost Estimate: I.T. Server Room Renovation-$300,000

Complete description, specifications and general conditions may be viewed at the Office of the Director of Facilities Planning and Purchasing Department at the above address, telephone (949) 582-4678 or previewed on-line at socccd.edu  Interested bidders may purchase complete bid documents from Repro X-press, 18207 McDurmott St., Suite I, Irvine, CA 92614, Phone: (866) 364-8569, Fax: (949) 336-7757. Payment will not be refunded, and the Project Documents are not required to be returned.

There will be a mandatory job walk and conference at 9:00 am, June 22, 2010 starting in front of the Health Sciences Building located adjacent to parking lot #13 at Saddleback College, 28000 Marguerite Parkway, Mission Viejo, CA 92692. Any bidder failing to attend the entire pre bid conference shall be deemed a non-responsive bidder and will have his bid returned unopened.

In accordance with the provisions of California Business and Professions Code Section 7028.15 and Public Contract Code Section 3300, the DISTRICT requires that the bidder possess the following classification of contractor’s license at the time the bid is submitted: Class B. Any bidder not so licensed at the time of the bid opening will be rejected as non-responsive.

Time is of the essence. Failure to complete the work within the time set forth in the bid documents will result in the imposition of liquidated damages for each day of delay in the amount set forth in the Information for Bidders.

Each bid shall be accompanied by a bid security in the form of cash, a certified or cashier's check or bid bond in an amount not less than ten percent (10%) of the total bid price, payable to the DISTRICT. In the event the successful bidder fails to enter into the contract and execute the required documents, the bid security shall be forfeited. The successful bidder shall furnish a satisfactory Performance Bond and a Payment Bond in amounts not less than one hundred percent (100%) of the total bid price.
The DISTRICT reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process.

The California Department of Industrial Relations has determined the general prevailing rates of per diem wages for the locality in which the work is to be performed for the Project. Copies of these wage rate determinations, entitled Prevailing Wage Scale, are maintained at the DISTRICT office and are available at the following website: www.dir.ca.gov. It shall be mandatory upon the successful bidder to whom the contract is awarded, and upon any subcontractor listed, to pay not less than the said specified rates to all workers employed by them for the Project. These requirements will be enforced through our Labor Compliance consulting firm.

No bidder may withdraw any bid for a period of ninety (90) calendar days after the date set for the opening of bids.

The general prevailing rate of per diem wages is based upon a working day of eight (8) hours. The rate for holiday and overtime work shall be at least time and one-half.

Pursuant to Section 22300 of the Public Contract Code, the Agreement will contain provisions permitting the successful bidder to substitute securities for any monies withheld by the DISTRICT to ensure performance under the Agreement or permitting payment of retention earned directly into escrow.

Prequalification is a requirement for bidding this project. Prequalification documents will be distributed at the mandatory job walk and conference.

Brandye K. D’Lena
Director,
Facilities Planning & Purchasing

PUBLISH: THE REGISTER
June 14, 2010
&
June 21, 2010

ATTENTION: LEGAL AD DEPARTMENT

In order for our Department to process payment, you MUST send Proof of Advertisement (Affidavit) on the date of publication to:

South Orange County Community College District
ATTN: Facilities Planning & Purchasing
28000 Marguerite Parkway
Mission Viejo, CA 92692

NOTE: PLEASE CALL LINDA HALL AT (949) 348-6017 WHEN AD IS RECEIVED.
INFORMATION FOR BIDDERS

WARNING:
READ THIS DOCUMENT CAREFULLY. DO NOT ASSUME
THAT IT IS THE SAME AS OTHER SIMILAR DOCUMENTS
YOU MAY HAVE SEEN, EVEN IF FROM THE SAME DISTRICT.

1. Preparation of Bid Form. Bids shall be submitted on the prescribed Bid Form, completed in full. All bid items and statements shall be properly and legibly filled out. Numbers shall be stated both in words and in figures where so indicated, and where there is a conflict in the words and the figures, the words shall control over the numbers. The signatures of all persons shall be in longhand and in ink. Prices, wording and notations must be in ink or typewritten.

2. Form and Delivery of Bids. The bid must conform and be responsive to all Project Documents and shall be made on the Bid Form provided, and the complete bid, together with any and all additional materials as required, shall be enclosed in a sealed envelope, addressed and hand delivered or mailed to the DISTRICT at:

South Orange County Community College District
Health Science Building, 3rd Floor
28000 Marguerite Parkway
Mission Viejo, CA, 92692

and must be received on or before the bid deadline (Public Contract Code Section 20112) The envelope shall be plainly marked in the upper left hand corner with the bidder's name, the Project designation and the date and time for the opening of bids. **It is the bidder's sole responsibility to ensure that its bid is received prior to the bid deadline.** In accordance with Government Code Section 53068, any bid received after the scheduled closing time for receipt of bids shall be returned to the bidder unopened. At the time and place set forth for the opening of bids, the sealed bids will be opened and publicly read aloud. However, if prequalification of bidders is required pursuant to Public Contract Code Section 20111.5 only those sealed bids received from prequalified bidders shall be opened and publicly read aloud.

3. Bid Security. Each bid shall be accompanied by a bid security in the form of cash, a certified or cashier's check or bid bond in the amount of not less than ten percent (10%) of the total bid price payable to the DISTRICT and shall be given as a guarantee that the bidder, if awarded the contract, will execute the Agreement within ten (10) working days after notice of award of the contract, and will furnish, on the prescribed forms, a satisfactory Faithful Performance Bond in an amount not less than one hundred percent (100%) of the total bid price and separate Payment (labor and material) Bond in an amount not less than one hundred percent (100%) of the total bid price, furnish certificates and endorsements evidencing that the required insurance is in effect, the Workers’ Compensation Certificate, Drug-Free Work Place Certification, the Criminal Records Check Certification, Contractor’s Certificate Regarding Non-Asbestos Containing Materials, and the Disabled Veteran Business Enterprises Certification, if applicable, all within ten(10) working days of the notice of award of the contract or as otherwise requested in writing by the DISTRICT. It is understood and agreed that should bidder fail or refuse to return these documents as required by the DISTRICT, the bid security shall be forfeited to the DISTRICT. If the Bidder elects to furnish a bid bond as its Bid Security, the Bidder shall use the bid bond form included in the Project Documents.

4. Signature. Any signature required on Project Documents must be signed in the name of the bidder and must bear the signature of the person or persons duly authorized to sign these documents. Where indicated, if bidder is a corporation, the legal name of the corporation shall first be set forth, together with two signatures: one from among the chairman of the board, president or vice president and one from among the secretary, chief financial officer, or treasurer. Alternatively, the signature of other authorized officers or agents may be affixed, if duly authorized by the corporation. Such documents shall include the title of such signatories below the signature and shall bear the corporate seal. Where indicated, in the event that the bidder is a joint venture or partnership, there shall be submitted with the bid certifications signed by
authorized officers of each of the parties to the joint venture or partnership, naming the individual who shall sign all necessary documents for the joint venture or partnership and, should the joint venture or partnership be the successful bidder, who shall act in all matters relative to the Project for the joint venture or partnership. If bidder is an individual, his/her signature shall be placed on such documents.

5. **Modifications.** Changes in or additions to any of the bid documents, summary of the work bid upon, alternative proposals, or any other modifications which are not specifically called for by the DISTRICT may result in the DISTRICT'S rejection of the bid as being nonresponsive. No oral, telephonic, facsimile or electronic modification of any of the bid documents will be considered.

6. **Erasures, Inconsistent or Illegible Bids.** The bid submitted must not contain any erasures, interlineations, or other corrections unless each such correction is authenticated by affixing the initials of the person(s) signing the bid in the margin immediately adjacent to the correction. In the event of inconsistency between words and numbers in the bid, words shall control numbers. In the event that DISTRICT determines that any bid is unintelligible, illegible or ambiguous, the DISTRICT may reject such bid as being nonresponsive.

7. **Examination of Site and Project Documents.** At its own expense and prior to submitting its bid, each bidder shall examine all documents relating to the Project; visit the site and determine the local conditions which may in any way affect the performance of the work, including the general prevailing rates of per diem wages and other relevant cost factors; familiarize itself with all Federal, State and Local laws, ordinances, rules, regulations and codes affecting the performance of the work, including the cost of permits and licenses required for the work; make such surveys and investigations, including investigation of subsurface or latent physical conditions at the site or where work is to be performed, as it may deem necessary for performance of the work at its bid price; determine the character, quality, and quantities of the work to be performed and the materials and equipment to be provided; and correlate its observations, investigations, and determinations with all requirements of the Project. The Project Documents show and describe the existing conditions as they are believed to have been used in the design of the work and are only provided as information for the bidder. The DISTRICT is not making any warranties regarding said information. The DISTRICT shall not be liable for any loss sustained by the successful bidder resulting from any variance between the conditions and design data given in the Project Documents and the actual conditions revealed during the bidder's pre-bid examination or during the progress of the work. **Bidder agrees that the submission of a bid shall be incontrovertible evidence that the bidder has complied with all the requirements of this provision of the Information for Bidders.**

8. **Withdrawal of Bids.** Any bid may be withdrawn, either personally or by written request signed by the bidder, at any time prior to the scheduled closing time for receipt of bids. The bid security for a bid withdrawn prior to the scheduled closing time for receipt of bids, in accordance with this paragraph, shall be returned. No bidder may withdraw any bid for a period of ninety (90) calendar days after the date set for the opening of bids.

9. **Agreement and Bonds.** The Agreement which the successful bidder will be required to execute and the payment bond required in accordance with Civil Code Section 3247, are included in the Project Documents. The payment bond shall be in the amount not less than one hundred percent (100%) of the amount of the contract in accordance with Civil Code Section 3248. The successful bidder will also be required to furnish a separate faithful performance bond in the amount of one hundred percent (100%) of the contract and in the form included in the Project Documents, which shall remain in full force and effect through the guarantee period as specified in the General Conditions. All bond premiums shall be at bidder’s cost.

10. **Interpretation of Project Documents.** If any bidder is in doubt as to the true meaning of any part of the Project Documents, or finds discrepancies in, or omissions from the Project Documents, a written request for an interpretation or correction thereof must be submitted to the DISTRICT no later than SEVEN (7) days before bid deadline. No requests shall be considered after this time. The bidder submitting the written request shall be responsible for its prompt delivery. Any interpretation or correction of the Project Documents will be made solely at DISTRICT’S discretion and only by written addendum duly issued by the DISTRICT, and a copy of such addendum will be hand delivered or mailed or faxed to each bidder known to have received a set of the Project Documents. No person is authorized to make any oral
interpretation of any provision in the Project Documents, nor shall any oral interpretation of Project Documents be binding on the DISTRICT. If there are discrepancies of any kind in the Project Documents, the interpretation of the DISTRICT shall prevail. Submittal of a bid without a request for clarification shall be incontrovertible evidence that the bidder has determined that the project documents are acceptable and sufficient for bidding and completing the work; that bidder is capable of reading, following and completing the work in accordance with the project documents; and that bidder agrees that the project can and will be completed according to the DISTRICT’s timelines and according to the progress schedule to be submitted by the successful bidder incorporating the DISTRICT’s timelines for completion of the project.

11. **Bidders Interested in More Than One Bid.** No person, firm or corporation shall be allowed to make, or file, or be interested in more than one bid for the same work unless alternate bids are specifically called for by the DISTRICT. A person, firm, or corporation that has submitted a sub-proposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a proposal or quoting prices to other bidders or submitting a bid on the Project.

12. **Award of Contract.** The DISTRICT reserves the right to reject any or all bids, or to waive any irregularities or informalities in any bids or in the bidding process. The award of the contract, if made by the DISTRICT, will be by action of the Governing Board and to the lowest responsive and responsible bidder. If two identical low bids are received from responsive and responsible bidders, the DISTRICT will determine which bid will be accepted pursuant to Public Contract Code Section 20117. In the event an award of the contract is made to a bidder, and such bidder fails or refuses to execute the Agreement and provide the required documents within fifteen (15) working days after the notice of award of the contract to bidder, the DISTRICT may award the contract to the next lowest responsive and responsible bidder or reject all bidders.

13. **Alternate Bids.** If alternate bids are called for, the DISTRICT will award the contract to the lowest responsive and responsible bidder based on the lowest total of the bid prices on the base contract without consideration of the prices on the additive or deductive items.

14. **Competency of Bidders.** In selecting the lowest responsive and responsible bidder, consideration will be given not only to the financial standing but also to the general competency of the bidder for the performance of the Project. By submitting a bid, each bidder agrees that the DISTRICT, in determining the successful bidder and its eligibility for the award, may consider the bidder’s experience and facilities, conduct and performance under other contracts, financial condition, reputation in the industry, and other factors which could affect the bidder’s performance of the Project. To this end, each bid shall be supported by a statement of the bidder’s experience on the form entitled “INFORMATION REQUIRED OF BIDDER.”

The DISTRICT may also consider the qualifications and experience of subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) proposed for those portions of the work. Operating costs, maintenance considerations, performance data and guarantees of materials and equipment may also be considered by the DISTRICT. In this regard, the DISTRICT may conduct such investigations as the DISTRICT deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of the bidder, proposed subcontractors, and other persons and organizations to do the work to the DISTRICT’s satisfaction within the prescribed time. The DISTRICT reserves the right to reject the bid of any bidder who does not pass any such evaluation to the satisfaction of the DISTRICT.

15. **Bidder's Prequalification.** Only Bid Proposals submitted by Prequalified Bidders will be considered. A Bid Proposal submitted by a Bidder who is not prequalified will be deemed a non-responsive Bid Proposal and will be rejected by the District. A Bidder who has not completed the Prequalification Application and has not been deemed a "Qualified Bidder" must complete the Prequalification Application and submit the Prequalification Application to the District (via the Construction Manager) by the date and in the manner set forth in the Prequalification Application. The failure to submit a completed Prequalification Application on or prior to such date will render the Bid Proposal of the Bidder untimely submitting a completed Prequalification Application to be non-responsive and rejected. If the District determines that any information provided by a Bidder in the Prequalification Application is false or misleading, or is incomplete so as to be false or misleading, the District may reject the Bid Proposal submitted by such Bidder as being non-responsive.
16. **Listing Subcontractors.** Each bidder shall submit, on the form furnished with the Project Documents, a list of the proposed subcontractors on this Project as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100, et seq.). If alternate bids are called for and the bidder intends to use different or additional subcontractors, a separate list of subcontractors must be submitted for each such alternate bid. If the bidder fails to specify a subcontractor for any portion of the work in excess of one half (1/2) of one percent (1%) of the bidder’s total bid, the bidder agrees that he/she is fully qualified to perform that work and agrees to perform that portion of the work. Violation of this requirement (including the procurement of a subcontractor for the Project if no subcontractor is specified) can result in the DISTRICT invoking the remedies of Public Contract Code Sections 4110 and 4111.

17. **Insurance and Workers' Compensation.** The successful bidder shall be required to furnish certificates and endorsements evidencing that the required insurance is in effect. DISTRICT may request that such certificates and endorsements are completed on DISTRICT provided forms. In accordance with the provisions of Section 3700 of the Labor Code, the successful bidder shall secure the payment of compensation to all employees. The successful bidder who has been awarded the contract shall sign and file with DISTRICT prior to performing the work, the Workers’ Compensation Certificate included as a part of the Project Documents. Labor Code Section 1861.

18. **Contractor's License.** If, at the time and date of the contract execution, bidder is not properly licensed to perform the Project in accordance with Division 3, Chapter 9, of the Business and Professions Code and the Project Documents, such bid will be rejected as nonresponsive. (Public Contract Code Section 3300) Pursuant to Business and Professions Code Section 7028.15, no payment shall be made for work or materials under the contract unless and until the Registrar of Contractors verifies to the DISTRICT that the bidder was properly licensed at the time the bid was submitted. Any bidder not so licensed is subject to penalties under the law and the contract will be considered void and DISTRICT shall have the right to bring an action against the unlicensed bidder awarded the contract for recovery of all compensation paid under the contract. (Business and Professions Code Section 7031(b)) If the license classification specified hereinafter is that of a "specialty contractor" as defined in Section 7058 of the Business and Professions Code, the specialty contractor awarded the contract for this work shall construct a majority of the work, in accordance with the provisions of Business and Professions Code Section 7059. The bidder may not use the contractor license of a third party for this bid.

19. **Anti-Discrimination.** In connection with all work performed under this Project, there shall be no unlawful discrimination against any prospective or active employee engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age, marital status, physical disability, mental disability, or medical condition. The successful bidder agrees to comply with applicable Federal and State laws including, but not limited to, the California Fair Employment and Housing Act, beginning with Government Code Section 12900 and Labor Code Section 1735. In addition, the successful bidder agrees to require like compliance by any subcontractors employed on the Project by such bidder.

20. **Hold Harmless and Indemnification.** The successful bidder awarded the contract will be required to indemnify and hold harmless the DISTRICT, its Governing Board, officers, agents, and employees as set forth in the Agreement.

21. **Substitutions.** Should the bidder wish to request any substitution for the materials, process, service, or equipment specified, the bidder shall be required to comply with Article 30 of the General Conditions.

22. **Surety Qualifications for Bonds.** Bidders shall ensure all surety companies have a minimum rating of "A-VIII," as rated by the current edition of Best's Key Rating Guide, published by A.M. Best Company, Oldwick, New Jersey 08858. Only California admitted surety insurers will be acceptable for the issuance of bonds. (Code of Civil Procedure Section 995.311) DISTRICT shall verify the status of the surety by one of the following ways: (1) printing out information from the website of the California Department of Insurance confirming the surety is an admitted surety insurer and attaching it to the bond, or (2) obtaining a certificate from the county clerk for the county in which the DISTRICT is located that confirms the surety is an admitted surety insurer and attaching it to the bond. Any admitted surety insurer who cannot satisfy the minimum rating specified above, but who satisfies the following requirements set forth in Code of Civil Procedure Section 995.660 shall be accepted and approved for the issuance of bonds.
(a) There must be on file in the office of the county clerk, for the county in which the DISTRICT is located, an unrevoked appointment, power of attorney, bylaws, or other instrument, duly certified by the proper authority and attested by the seal of the insurer authorizing the person who executed the bond to do so for and on behalf of the insurer within ten (10) calendar days of the insurer’s receipt of a request to submit such document from the DISTRICT, and an original or certified copy of the document must be submitted to the DISTRICT.

(b) A certified copy of the certificate of authority of the insurer issued by the Insurance Commissioner must be submitted to the DISTRICT within ten (10) calendar days of the insurer’s receipt of a request to submit such document from the DISTRICT.

(c) A certificate from the clerk of the county that the certificate of authority of the insurer has not been surrendered, revoked, cancelled, annulled, or suspended, and in the event it has, whether renewed authority has been granted must be submitted to DISTRICT within ten (10) calendar days of the insurer’s receipt of a request to submit such document from the DISTRICT.

(d) Copies of the insurer’s most recent annual statement and quarterly statement filed with the California Department of Insurance must be submitted to the DISTRICT within ten (10) calendar days of the insurer’s receipt of a request to submit the statements.

23. Liquidated Damages. All work must be completed within the time limits set forth in the Project Documents. It is agreed that damages for the failure to complete the Project described herein within the time limits required are impossible to ascertain. Should the work not be completed within the specified time for completion, the successful bidder awarded the contract shall be liable for liquidated damages, payable to the DISTRICT, in an amount of One Thousand Dollars ($1,000.00) for each consecutive calendar day of delay in completion. Such damages shall be deducted from any payments due or to become due to the successful bidder. Government Code Section 53069.85, Civil Code Section 1671.

24. Drug-Free Workplace Certification. Pursuant to Government Code Sections 8350, et seq., the successful bidder will be required to execute a Drug-Free Workplace Certification upon execution of the Agreement. The bidder will be required to take positive measures outlined in the certification in order to ensure the presence of a drug-free workplace. Failure to abide with the conditions set forth in the Drug-Free Workplace Act could result in penalties including termination of the Agreement or suspension of payment thereunder.

25. Noncollusion Affidavit. In accordance with the provisions of Section 7106 of the Public Contract Code, each bid must be accompanied by a noncollusion affidavit properly notarized.

26. Escrow Agreement. Public Contract Code Section 22300 permits the substitution of securities for any monies withheld by a public agency to ensure performance under a contract. At the request and expense of the successful bidder awarded the contract, securities equivalent to the amount withheld as retention shall be deposited with the DISTRICT, or with a state or federally chartered bank in California as the escrow agent, who shall then pay such monies to the successful bidder. The DISTRICT retains the sole discretion to approve the bank selected by the successful bidder to serve as escrow agent. Upon satisfactory completion of the contract, the securities shall be returned to the successful bidder. Securities eligible for investment shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The successful bidder shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

In the alternative, under Section 22300, the successful bidder may request DISTRICT to make payment of earned retentions directly to the escrow agent at the expense of the successful bidder. Also at the successful bidder's expense, the successful bidder may direct investment of the payments into securities, and the successful bidder shall receive interest earned on such investment upon the same conditions as provided for securities deposited by successful bidder. Upon satisfactory completion of the contract, successful bidder shall receive from the escrow agent all securities, interest and payments received by escrow agent from DISTRICT pursuant to the terms of Section 22300.
The successful bidder who elects to receive interest on monies withheld in retention by the DISTRICT shall, at the request of any subcontractor performing more than five percent (5%) of the successful bidder’s total bid, make that option available to the subcontractor regarding any monies withheld in retention by the successful bidder from the subcontractor. If the successful bidder elects to receive interest on any monies withheld in retention by the DISTRICT, then the subcontractor shall receive the identical rate of interest received by the successful bidder on any retention monies withheld from the subcontractor by the successful bidder, less any actual pro rata costs associated with administering and calculating that interest. In the event that the interest rate is a fluctuating rate, the rate for the subcontractor shall be determined by calculating the interest rate paid during the time that retentions were withheld from the subcontractor. If the successful bidder elects to substitute securities in lieu of retention, then, by mutual consent of the successful bidder and subcontractor, the subcontractor may substitute securities in exchange for the release of monies held in retention by the successful bidder. Public Contract Code Section 22300(d)(1).

The successful bidder wishing to utilize Public Contract Code Section 22300 and enter into an Escrow Agreement shall complete and execute the form Escrow Agreement included in the Project Documents and submit it to the DISTRICT.

27. **Change Orders.** All change order requests must be submitted in the form set forth in the Project Documents and pursuant to Article 60 of the General Conditions. The amount of allowable charges submitted pursuant to a change order shall be limited to the charges allowed under Article 60 of the General Conditions. Indirect, consequential and incidental costs, project management costs, extended home office and field office overhead, administrative costs and profit and other charges not specifically authorized under Article 60 of the General Conditions will not be allowed.

28. **Tobacco-Free Policy.** The successful bidder shall agree to enforce a tobacco-free work site.

29. **Lead.** Pursuant to the Lead-Safe Schools Protection Act (Education Code Sections 32240, et seq.) and other applicable law, the successful bidder shall not use lead-based paint, lead plumbing and solders, or other potential sources of lead contamination in the construction of any new school facility or the modernization or renovation of any existing school facility.

30. The number of executed copies of the Agreement, the Faithful Performance Bond, and the Payment Bond required is THREE (3).
Name of Bidder: ________________________________

To: South Orange County Community College District, acting by and through its Governing Board, herein called the "DISTRICT."

1. The undersigned Bidder, having become familiarized with all the following documents including but not limited to the Notice Calling for Bids, Information for Bidders, Bid Form, Bid Security, Designation of Subcontractors Form, Information Required of Bidder, all prequalification forms pursuant to Public Contract Code Section 20111.5, if any, Noncollusion Affidavit, Workers’ Compensation Certificate, Faithful Performance Bond, Payment Bond, Agreement, Escrow Agreement, Drug-Free Workplace Certification, Criminal Records Check Certification, Change Order Forms, Shop Drawing Transmittal Form, all insurance requirements, Guarantee forms, Contractor’s Certificate Regarding Non-Asbestos Containing Materials, Disabled Veteran Business Enterprises Certification, if applicable, General Conditions and Supplemental Conditions, if any, Special Conditions, if any, drawings, specifications, and all modifications, addenda and amendments, if any (hereinafter Project Documents), the local conditions affecting the performance of the work and the cost of the work at the place where the work is to be done, hereby proposes and agrees to be bound by all the terms and conditions of the Project Documents and agrees to perform, within the time stipulated, the work, including all of its component parts, and everything required to be performed, and to provide and furnish and pay for any and all of the labor, materials, tools, expendable equipment, and all applicable taxes, utility and transportation services necessary to perform the work and complete in a good workmanlike manner all of the work required in accordance with laws, codes, regulations, ordinances and any other legal requirements governing the work, in connection with the following:

Project: I.T. SERVER ROOM RENOVATION, Saddleback College  
Project No.: Bid No. #1097

all in strict conformity with the Project Documents, including Addenda Nos. _____, _____, _____ and _____, on file at the office of the Director of Facilities Planning and Purchasing of said DISTRICT for the following sums:

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<tr>
<td>1) BASE BID PRICE</td>
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<td>2) ALLOWANCE:</td>
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<td>BID TOTAL (Including Allowance)</td>
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<td>$ _________________________</td>
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Each individual bid term shall be determined from visiting the work site, reviewing the drawings and specifications and all portions of the Project Documents, and shall include all items necessary to complete the work, including the assumption of all obligations, duties, and responsibilities necessary to the successful completion of the Project, and the furnishing of all materials and equipment required to be incorporated in and form a permanent part of the work, and the furnishing of tools, equipment, supplies, transportation, facilities, labor, superintendence, and services required to perform and complete the work, all as per the requirements of the Project Documents, whether or not expressly listed or designated.
2. It is understood that the DISTRICT reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process. Bidder agrees that this bid shall remain open and not be withdrawn for the period specified in the Information for Bidders.

3. The required bid security is attached.

4. The required list(s) of proposed subcontractors is attached hereto, and the undersigned represents and warrants that such list(s) is complete and in compliance with the Subletting and Subcontracting Fair Practices Act. Public Contract Code Sections 4100, et seq.

5. It is understood and agreed that if written notice of the award of a contract is mailed, faxed, or delivered to the bidder, the bidder will execute and deliver to the DISTRICT the Agreement and will also furnish and deliver to the DISTRICT the Faithful Performance Bond and a separate Payment Bond as specified, and certificates and endorsements of insurance, the Workers' Compensation Certificate, Drug-Free Work Place Certification, the Criminal Records Check Certification, Contractor's Certificate Regarding Non-Asbestos Containing Materials, and the Disabled Veteran Business Enterprises Certification, if applicable, within 10 working days of the notice of award of the contract, or as otherwise requested in writing by the DISTRICT. It is understood that should bidder fail or refuse to return these documents as required by the DISTRICT, the bid security shall be forfeited to the DISTRICT. The bidder further agrees that the work shall be commenced by the bidder, if awarded the contract, on or before the fifth day after receiving the DISTRICT's Notice to Proceed, and shall be completed by the bidder in the time specified by the DISTRICT.

6. Communications conveying notice of award of the contract, requests for additional information or other correspondence should be addressed to the bidder at the address stated below.

7. The name(s) of all persons interested in the bid as principals are as follows:

8. In submitting this bid, the bidder offers and agrees that if the bid is accepted, it will assign to DISTRICT all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Business & Professions Code Section 16700, et seq.) arising from purchases of goods, materials, or services by the bidder for sale to the DISTRICT pursuant to the bid. Such assignment shall be made and become effective at the time the DISTRICT tenders final payment under the contract. (Public Contract Code Section 7103.5; Government Code Section 4450, 4451 and 4552).

9. The undersigned hereby warrants that the bidder has an appropriate license, License No. _____________________, Class B, at the time of the bid opening, that such license entitles bidder to provide the work, that such license will be in full force and effect throughout the duration of performance of this Project. Bidder shall be nonresponsive if the Bidder is not licensed as required by the DISTRICT at the time of the bid opening. Any and all subcontractors to be employed by the undersigned shall have appropriate licenses at the time of the bid opening.

10. The bidder hereby certifies that it is, and at all times during the performance of work hereunder shall be, in full compliance with the provisions of the Immigration Reform and Control Act of 1986 ("IRCA") in the hiring of its employees, and the bidder shall indemnify, hold harmless and defend the DISTRICT against any and all actions, proceedings, penalties or claims arising out of the bidder's failure to comply strictly with the IRCA.

11. It is understood and agreed that if requested by the DISTRICT, the bidder shall furnish a notarized financial statement, references, and other information required by the DISTRICT sufficiently comprehensive to permit an appraisal of bidder's ability to perform the Project.
12. The undersigned hereby warrants that all work, except work of a maintenance period, shall be completed within 45 consecutive calendar days from the date specified on the Notice to Proceed issued by the District. Time is of the essence. The undersigned agrees that failure to complete the work within the time set forth herein will result in the imposition of liquidated damages for each consecutive calendar day of delay in the amount of One Thousand Dollars ($1,000.00). (Government Code Section 53069.85)

13. The required non-collusion affidavit properly notarized is attached as required by Public Contract Code Section 7106. Bidder understands and agrees that failure to submit a completed and signed affidavit will render the bidder automatically nonresponsive.

14. It is understood and agreed that all change order requests must be submitted in the form set forth in the Project Documents and pursuant to Article 60 of the General Conditions. The amount of allowable charges submitted pursuant to a change order shall be limited to the charges allowed under Article 60 of the General Conditions. Indirect, consequential and incidental costs, project management costs, extended home office and field office overhead, administrative costs and profit and other charges not specifically authorized under Article 60 of the General Conditions will not be allowed.

15. The Information Required of Bidder form has been fully completed and is attached hereto.
The undersigned hereby declares that all of the representations of this bid are made under penalty of perjury under the laws of the State of California.

Individual

Name: __________________________________________

Signed by: ______________________________________

Print Name: ______________________________________

Date: ___________________________________________

Business Address: ______________________________________

Telephone: ______________________________________

******************************************************************************

Partnership

Name: __________________________________________

Signed by: ______________________________________

Print Name: ______________________________________

Date: ___________________________________________

Business Address: ______________________________________

Telephone: ______________________________________

******************************************************************************

Corporation

Name: __________________________________________

(a ________ Corporation\(^1\))

_______________________________

\(^1\) A corporation awarded the contract shall furnish evidence of its corporate existence and evidence that the officer signing the Agreement and bonds is duly authorized to do so.
Business Address: ______________________________________

_____________________________________________________

Telephone: ____________________________________________

Signed by: ______________________, President, Date: ________

Print Name: ______________________ President

Signed by: ______________________, Secretary, Date: ________

Print Name: ______________________ Secretary

[Seal]
Joint Venturer

Name: __________________________________________

Signed by: __________________________________________, Joint Venturer

Print Name: __________________________________________

Date: __________________________________________

Business Address: __________________________________________

________________________________________

Telephone: __________________________________________

Other Parties to  If an individual: __________________________________________

Joint Venture: __________________________________________ (Name)

Signed by: __________________________________________

Print Name: __________________________________________

Date: __________________________________________

Doing Business as: __________________________________________

Business Address: __________________________________________

________________________________________

Telephone: __________________________________________
If a Partnership: ________________________________

(Name)

Signed by: ________________________________, Partner

Print Name: ________________________________

Date: ________________________________

Business Address: ________________________________

____________________________________

Telephone: ________________________________

If a Corporation: ________________________________

(a Corporation)

Signed By: ________________________________  Date: ________________________________

Print Name: ________________________________

Title: ________________________________

Date: ________________________________

Business Address: ________________________________

____________________________________

Telephone: ________________________________
Bid Bond No.: _____

KNOW ALL PERSONS BY THESE PRESENT, that we ____________________________,
as Principal, and __________________________ as Surety, a California admitted surety insurer, are held and firmly
bound unto the South Orange County Community College District, hereinafter called the DISTRICT, in the sum of _______

____________________ PERCENT (%) OF THE TOTAL AMOUNT OF THE BID of the Principal submitted to the
said DISTRICT for the work described below for the payment of which sum in lawful money of the United States, well and
truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of this obligation is such that whereas the Principal has submitted the accompanying bid dated

_______, ________, for

________________________________________________________

________________________________________________________

NOW, THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the
opening of the same, or, if no period be specified, within sixty (60) days after said opening; and if the Principal is awarded
the contract, and shall within the period specified therefore, or, if no period be specified, within 10 working days after the
notice of award of the contract, or as otherwise requested in writing by the DISTRICT, enter into a written contract with the
DISTRICT, in accordance with the bid as accepted and give bonds with good and sufficient surety or sureties, as may be
required for the faithful performance and proper fulfillment of such contract and for the payment for labor and materials used
for the performance of the contract, furnish certificates and endorsements evidencing the required insurance is in effect and
furnish and deliver to the DISTRICT the Workers’ Compensation Certificate, Drug-Free Work Place Certification, the
Criminal Records Check Certification, Contractor’s Certificate Regarding Non-Asbestos Containing Materials, and the
Disabled Veteran Business Enterprises Certification, if applicable, then the above obligation shall be void and of no effect,
otherwise the bond amount shall be forfeited to the DISTRICT.

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

In the event suit is brought upon this bond by the DISTRICT and judgment is recovered, the Surety shall pay all
costs incurred by the DISTRICT in such suit, including reasonable attorney's fees to be fixed by the court.
IN WITNESS HEREOF, the parties have executed this bond under their several seals this ______ day of ______, 20___, the name and corporate seal of each corporate party being hereto affixed and duly signed by its undersigned authorized representative.

(Corporate Seal of Principal, if Corporation)  

By: ____________________________  
Signature  
Print Name  
Title

(Corporate Seal of Surety)  

Surety

(Attach Attorney-in-Fact Certificate and Required Acknowledgements)  

By: ____________________________  
Signature  
Print Name  
Title  
Address  
Telephone No.  
Facsimile No.
DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100 et. seq.) and any amendments thereof, each bidder shall set forth below: (a) the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the bidder (prime contractor) in or about the construction of the work or improvement to be performed under this contract or a subcontractor licensed by the State of California who, under subcontract to the bidder (prime contractor), specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications in an amount in excess of one-half of one percent of the bidder's (prime contractor's) total bid and (b) the portion of the work which will be done by each subcontractor. The bidder (prime contractor) shall list only one subcontractor for each such portion as is defined by the bidder (prime contractor) in this bid.

If a bidder (prime contractor) fails to specify a subcontractor or if a bidder (prime contractor) specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of one percent of the bidder's (prime contractor's) total bid, bidder shall be deemed to have agreed that bidder is fully qualified to perform that portion, and that bidder alone shall perform that portion. Violation of this requirement (including the procurement of a subcontractor for the Project if no subcontractor is specified) can result in the DISTRICT invoking the remedies of Public Contract Code Sections 4110 and 4111.

No bidder (prime contractor) whose bid is accepted shall (a) substitute any subcontractor, (b) permit any subcontractor to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid, or (c) sublet or subcontract any portion of the work in excess of one-half of one percent of the bidder's (prime contractor's) total bid as to which the original bid did not designate a subcontractor, except as authorized in the Subletting and Subcontracting Fair Practices Act. Subletting or subcontracting of any portion of the work in excess of one-half of one percent of the bidder's (prime contractor's) total bid as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, only after a finding reduced to writing as a public record of the DISTRICT awarding this contract setting forth the facts constituting the emergency or necessity.
### Fine Arts Repair and New Exterior Finishes and Color Selection at Saddleback College
#### Project No.: Bid No. #1095

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<tr>
<th>Type of Trade, Labor or Service</th>
<th>Name &amp; License # of Subcontractor, License Expiration Date (Indicate if a Disabled Veteran Business Enterprise)</th>
<th>Complete Address (Name of City is not sufficient) and Telephone No.</th>
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Bidder agrees that within twenty-four (24) hours of the bid opening, Bidder shall provide the DISTRICT with the license number (if applicable), expiration date of license, complete address and telephone numbers of each listed subcontractor if such information is not available at the time of the bid opening.
Dated: ____________________________

Name of Bidder

By: ________________________________

(Signature of Bidder)

Print Name: ____________________________

Address: ______________________________

____________________________________

____________________________________

Telephone: ____________________________

FAX: _________________________________
NONCOLLUSION AFFIDAVIT

(Public Contract Code Section 7106)

State of California  )
 ) ss.
County of__________________ )
 )
__________________________  , being first duly sworn, deposes and says that he or she is ______________________
__________________________, 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.

__________________________
Signature of Bidder

NOTARY FOR NONCOLLUSION AFFIDAVIT

Subscribed and sworn to (or affirmed) before me this ______ day of_______, 20__.

__________________________
Signature of Notary

[SEAL OF NOTARY]

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

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

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

(c) For any county, city, city and county, municipal corporation, public district, public agency or any political subdivision of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers' compensation claims, which certificate may be given upon furnishing proof satisfactory to the director of ability to administer workers' compensation claims properly, and to pay workers' compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which, on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers' compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702."

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

______________________________
Name of the Contractor

By: ____________________________
Signature

______________________________
Print Name

______________________________
Title

______________________________
Date

(In accordance with Article 5 [commencing at Section 1860], Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under the contract.)
PAYMENT BOND (CALIFORNIA PUBLIC WORK)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the South Orange County Community College District (sometimes referred to hereinafter as “DISTRICT”) has awarded to ___________________________(hereinafter designated as the “CONTRACTOR” or “Principal”), an agreement for the work described as follows: ___________________________ (hereinafter referred to as the “Public Work”); and

WHEREAS, said CONTRACTOR is required to furnish a bond in connection with said Contract, and pursuant to California Civil Code Section 3247;

NOW, THEREFORE, We, ____________________________, the undersigned CONTRACTOR, as Principal; and ____________________________, a corporation organized and existing under the laws of the State of ____________________________, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the South Orange County Community College District and to any and all persons, companies, or corporations entitled by law to file stop notices under California Civil Code Section 3181, or any person, company, or corporation entitled to make a claim on this bond, in the sum of ____________________________ Dollars ($__________________), said sum being not less than one hundred percent (100%) of the total amount payable by said DISTRICT under the terms of said Contract, for which payment will and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in Civil Code Section 3181; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code Section 13020 with respect to work and labor thereon of any kind, then said Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys’ fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code Sections 3247 et seq.

This bond shall inure to the benefit of any person named in Civil Code Section 3181 giving such person or his/her assigns a right of action in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefore; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons

Schools Legal Service of O.C.  
May 2002  
Bid Forms  
Page 24
for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the DISTRICT and the CONTRACTOR or on the part of any DISTRICT named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code Sections 3110 and 3112, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this______________ day of _______ ________, 20____.

PRINCIPAL/CONTRACTOR:

________________________________________

By: _______________________________________

SURETY:

________________________________________

By: _______________________________________

Attorney-in-Fact
IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety’s name must also appear on the Treasury Department’s most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)  (Name and Address of agent or representative for service for service of process in California)

__________________________________________  ____________________________________________

__________________________________________  ____________________________________________

Telephone:__________________________________  Telephone: _________________________________

STATE OF CALIFORNIA )

) ss.  )

COUNTY OF )

On this _____ day of ______________, in the year ____________, before me, ____________________, a Notary Public in and for said State, personally appeared ____________________________, known to me to be the person whose name is subscribed within the instrument as the Attorney-in-Fact of the ____________________________ (Surety) and acknowledged to me that he subscribed the name of the ____________________________ (Surety) thereto and his own name as Attorney-in-Fact.

______________________________________________  (SEAL)

Notary Public in and for said State

Commission expires: ______________________________

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.
CONTRACT PERFORMANCE BOND (CALIFORNIA PUBLIC WORK)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the South Orange County Community College District (sometimes referred to hereinafter as “DISTRICT”) has awarded to ___________________________ (hereinafter designated as the “CONTRACTOR” or “Principal”), an agreement for the work described as follows: ___________________________ (hereinafter referred to as the “Public Work”); and

WHEREAS, the work to be performed by the CONTRACTOR is more particularly set forth in that certain contract for said Public Work dated ________________________, (hereinafter referred to as the “Contract”), which Contract is incorporated herein by this reference; and

WHEREAS, the CONTRACTOR is required by said Contract to perform the terms thereof and to provide a bond both for the performance and guaranty thereof.

NOW, THEREFORE, we, ___________________________, the undersigned CONTRACTOR, as Principal, and ___________________________, a corporation organized and existing under the laws of the State of ________________, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the South Orange County Community College District in the sum of ___________________________ Dollars ($_____________), said sum being not less than one hundred percent (100%) of the total amount payable by said DISTRICT under the terms of said Contract, for which amount well and truly to be made, we 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 bounded CONTRACTOR, his or her 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 said Contract and any alteration thereof made as therein provided, on his or her part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill guarantees of all materials and workmanship; and indemnify, defend and save harmless the DISTRICT, its officers and agents, as stipulated in said Contract, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any change, extension of time, alteration in or addition to the terms of the contract or to the work to be performed there under or the specifications accompanying the same, nor by any change or modification to any terms of payment or extension of time for any payment pertaining or relating to any scheme of work of improvement under the contract. Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any overpayment or underpayment by the DISTRICT that is based upon estimates approved by the Architect. The Surety stipulates and agrees that none of the aforementioned changes, modifications, alterations, additions, extension of time or actions shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, modifications, alterations, additions or extension of time to the terms of the contract, or to the work, or the specifications as well notice of any other actions that result in the foregoing.
As a condition precedent to the satisfactory completion of the contract, the above obligation shall hold good for a period of One (1) year(s) after the acceptance of the work by DISTRICT, during which time if Contractor/Principal shall fail to make full, complete, and satisfactory repair and replacements and totally protect the DISTRICT from loss or damage made evident during the period of One (1) year(s) from the date of completion of the work, and resulting from or caused by defective materials or faulty workmanship, the above obligation in penal sum thereof shall remain in full force and effect. The obligation of Surety hereunder shall continue so long as any obligation of Contractor remains.

Whenever Principal shall be, and is declared by the DISTRICT to be, in default under the Contract, the Surety shall promptly either remedy the default, or shall promptly complete the Contract through its agents or independent contractors, subject to acceptance and approval of such agents or independent contractors by DISTRICT as hereinafter set forth, in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages; or, at DISTRICT’s sole discretion and election, Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by DISTRICT of the lowest responsible bidder, arrange for a contract between such bidder and the DISTRICT and make available as Work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the “balance of the Contract price” (as hereinafter defined), and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages. The term “balance of the Contract price,” as used in this paragraph, shall mean the total amount payable to Principal by the DISTRICT under the Contract and any modifications thereto, less the amount previously paid by the DISTRICT to the Principal, less any withholdings by the DISTRICT allowed under the Contract.

Surety expressly agrees that the DISTRICT may reject any agent or contractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Principal. Unless otherwise agreed by DISTRICT, in its sole discretion, Surety shall not utilize Principal in completing the Contract nor shall Surety accept a bid from Principal for completion of the work in the event of default by the Principal.

No final settlement between the DISTRICT and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

CONTRACTOR and Surety agree that if the DISTRICT is required to engage the services of an attorney in connection with enforcement of the bond, CONTRACTOR and Surety shall pay DISTRICT’s reasonable attorneys’ fees incurred, with or without suit, in addition to the above sum.

In the event suit is brought upon this bond by the DISTRICT and judgment is recovered, the Surety shall pay all costs incurred by the DISTRICT in such suit, including reasonable attorneys’ fees to be fixed by the Court.
IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of ____________, 20__.

PRINCIPAL/CONTRACTOR:

____________________________________________________________________________

By: _______________________________________________________________________

SURETY:

____________________________________________________________________________

By: _______________________________________________________________________

Attorney-in-Fact

The rate of premium on this bond is ____________________________ per thousand.

The total amount of premium charged: $_________________________ (This must be filled in by a corporate surety).
IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety’s name must also appear on the Treasury Department’s most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)                           (Name and Address of agent or representative for service for service of process in California)

_________________________________________________________  ___________________________________________________________

_________________________________________________________  ___________________________________________________________

Telephone:_________________________________________  Telephone: ________________________________

STATE OF CALIFORNIA                                   )

COUNTY OF )

On this ___________day of __________, in the year______, before me, __________________________________________________________________, a Notary Public in and for said State, personally appeared __________________________________________________________________, known to me to be the person whose name is subscribed within the instrument as the Attorney-in-Fact of the (Surety) and acknowledged to me that he subscribed the name of the (Surety) thereto and his own name as Attorney-in-Fact.

__________________________________________________________________________________  (SEAL)

Notary Public in and for said State

Commission expires:_____________________________

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.
AGREEMENT

THIS AGREEMENT, dated the ______ day of ____________, 20____, in the County of Orange, State of California, is by and between South Orange County Community College District, (hereinafter referred to as "DISTRICT"), and _____________________________, (hereinafter referred to as "CONTRACTOR").

The DISTRICT and the CONTRACTOR, for the consideration stated herein, agree as follows:

1. CONTRACTOR agrees to complete the Project known as I.T. SERVER ROOM RENOVATION BID NO. 1097 according to all the terms and conditions set forth in the Project Documents, including but not limited to the Notice Calling For Bids, Information for Bidders, Bid Form, Bid Security, Designation of Subcontractors, Information Required of Bidder, all prequalification forms submitted pursuant to Public Contract Code Section 20111.5, if any, Non-collusion Affidavit, Workers' Compensation Certificate, Faithful Performance Bond, Payment Bond, Escrow Agreement, if applicable, Drug-Free Workplace Certification, Change Orders, Shop Drawing Transmittals, Insurance Certificates and Endorsements, Guarantees, Contractor’s Certificate Regarding Non-Asbestos Containing Materials, Disabled Veteran Business Enterprises Certification, if applicable, General Conditions, Supplemental Conditions, if any, Special Conditions, if any, Drawings, Specifications, and all modifications, addenda and amendments thereto by this reference incorporated herein. The Project Documents are complementary, and what is called for by any one shall be as binding as if called for by all.

2. CONTRACTOR shall perform within the time set forth in Paragraph 4 of this Agreement everything required to be performed, and shall provide, furnish and pay for all the labor, materials, necessary tools, expendable equipment, and all taxes, utility and transportation services required for construction of the Project. All of said work shall be performed and completed in a good workmanlike manner in strict accordance with the drawings, specifications and all provisions of this Agreement as hereinafter defined and in accordance with applicable laws, codes, regulations, ordinances and any other legal requirements governing the Project. The CONTRACTOR shall be liable to the DISTRICT for any damages arising as a result of a failure to fully comply with this obligation, and the CONTRACTOR shall not be excused with respect to any failure to so comply by any act or omission of the Architect, Engineer, Inspector, Division of State Architect, or representative of any of them, unless such act or omission actually prevents the CONTRACTOR from fully complying with the requirements of the Project Documents, and unless the CONTRACTOR protests at the time of such alleged prevention that the act or omission is preventing the CONTRACTOR from fully complying with the Project Documents. Such protest shall not be effective unless reduced to writing and filed with the DISTRICT within three (3) working days of the date of occurrence of the act or omission preventing the CONTRACTOR from fully complying with the Project Documents.

3. DISTRICT shall pay to the CONTRACTOR, as full consideration for the faithful performance of this Agreement, subject to any additions or deductions as provided in the Project Documents, the sum of ______________________________________________________ Dollars ($__________ _______).

4. The work shall be commenced on or before the _____________ (_____) day after receiving the DISTRICT'S Notice to Proceed and shall be completed within ______________ (____) consecutive calendar days from the date specified in the Notice to Proceed.
5. **Time is of the essence.** If the work is not completed in accordance with Paragraph 4 above, it is understood that the DISTRICT will suffer damage. It being impractical and infeasible to determine the amount of actual damage, in accordance with Government Code Section 53069.85, it is agreed that CONTRACTOR shall pay to DISTRICT as fixed and liquidated damages, and not as a penalty, the sum of ___ONE____ THOUSAND ___ Dollars ($1,000.00) for each calendar day of delay until work is completed and accepted. Time extensions may be granted by the DISTRICT as provided in Article 64 of the General Conditions. Liquidated damages shall be imposed as set forth in Article 64 of the General Conditions.

6. **Termination for Cause or Non-appropriation.** In the event CONTRACTOR defaults in the performance of the Agreement as set forth in General Conditions Article 13(a) or if there is a non-appropriation of funds or insufficient funds as set forth in General Conditions Article 13(d), then this Agreement shall terminate or be suspended as set forth in General Conditions Article 13.

Termination for Convenience. DISTRICT has discretion to terminate this Agreement at any time and require CONTRACTOR to cease all work on the Project by providing CONTRACTOR written notice of termination specifying the desired date of termination. Upon receipt of written notice from DISTRICT of such termination for DISTRICT’s convenience, CONTRACTOR shall:

(i) Cease operations as directed by DISTRICT in the notice;

(ii) Take any actions necessary, or that DISTRICT may direct, for the protection and preservation of the work; and

(iii) Not terminate any insurance provisions required by the Project Documents.

In case of such termination for DISTRICT’s convenience, CONTRACTOR shall be entitled to receive payment from DISTRICT for work satisfactorily executed and for proven loss with respect to materials, equipment, and tools, including overhead and profit for that portion of the work completed. In the case of Termination for Convenience, DISTRICT shall have the right to accept assignment of subcontractors. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the DISTRICT.

7. **Hold Harmless and Indemnification.** To the fullest extent permitted by law, the CONTRACTOR, at the CONTRACTOR’s sole cost and expense, agrees to fully defend, indemnify and hold harmless, the DISTRICT, including but not limited to any of its governing board members, officers, employees, Construction Manager, Architect, and all other Agents and Representatives, from and against any and all claims, actions, demands, costs, judgments, liens, penalties, liabilities, damages, losses, anticipated losses of revenues, and expenses, including any fees of accountants, attorneys or other professionals, arising out of, in connection with, resulting from or related to, or claimed to be arising out of, in connection with, resulting from or related to any act or omission by the CONTRACTOR or any of its officers, agents, employees, subcontractors, sub-subcontractors, any person performing any of the work pursuant to a direct or indirect contract with the CONTRACTOR or individual entities comprising the CONTRACTOR, in connection with or relating to, or claimed to be in connection with or relating to the work, this Agreement, or the Project, including but not limited to any costs or liabilities arising out of or in connection with:

(a) failure to comply with any applicable law, statute, code, ordinance, regulation, permit or orders;

(b) any misrepresentation, misstatement or omission with respect to any statement made in the Project Documents or any document furnished by the CONTRACTOR in connection therewith;

(c) any breach of duty, obligation or requirement under the Project Documents;
(d) any failure to coordinate the work of other contractors;
(e) any failure to provide notice to any party as required under the Project Documents;
(f) any failure to act in such a manner as to protect the DISTRICT and the Project from loss, cost, expense or liability; or
(g) any failure to protect the property of any utility company or property owner.

This indemnity shall survive termination of the contract or final payment thereunder. This indemnity is in addition to any other rights or remedies which the DISTRICT may have under the law or under the Project Documents. In the event of any claim or demand made against any party which is entitled to be indemnified hereunder, the DISTRICT may in its sole discretion reserve, retain or apply any monies due to the CONTRACTOR under the Project Documents for the purpose of resolving such claims; provided, however, that the DISTRICT may release such funds if the CONTRACTOR provides the DISTRICT with reasonable assurance of protection of the DISTRICT’s interests. The DISTRICT shall in its sole discretion determine whether such assurances are reasonable.

8. CONTRACTOR shall take out, prior to commencing the work, and maintain, during the life of this Agreement, and shall require all subcontractors, if any, whether primary or secondary, to take out and maintain the insurance coverage’s set forth below and in Articles 16, 17, 18 and 19 of the General Conditions. CONTRACTOR agrees to provide all evidences of coverage required by DISTRICT including certificates of insurance and endorsements.

Public Liability Insurance for injuries including accidental death, to any one person in an amount not less than $1,000,000

Subcontractors of every tier $1,000,000

and

Subject to the same limit for each person on account of one accident, in an amount not less than $1,000,000

Subcontractors of every tier $1,000,000

Property Damage Insurance in an amount not less than $1,000,000

Subcontractors of every tier $1,000,000

Course of Construction Insurance without exclusion or limitation in an amount not less than $1,000,000

Excess Liability Insurance (Contractor only) $1,000,000

Insurance Covering Special Hazards: The following special hazards shall be covered by rider or riders to above-mentioned public liability insurance or property damage insurance policy or policies of insurance, or by special policies of insurance in amounts as follows:

Automotive and truck where operated in amounts as above
Material hoist where used in amounts as above
Waiver of Subrogation

Contractor waives (to the extent permitted by law) any right to recover against the District, and its respective elected officials, officers, employees, agents, and representatives for damages to the Work, any part thereof, or any and all claims arising by reason of any of the foregoing, but only to the extent that such damages and/or claims are covered by property insurance and only to the extent of such coverage (which shall exclude deductible amounts) actually carried by the District.

The provisions of this section are intended to restrict each party to recovery against insurance carriers only to the extent of such coverage and waive fully and for the benefit of each, any rights and/or claims which might give rise to a right of subrogation in any insurance carrier. The District and the Contractor shall each obtain in all policies of insurance carried by either of them, a waiver by the insurance companies there under of all rights of recovery by way of subrogation for any damages or claims covered by the insurance.

Additional Insured Endorsement Requirements.

The Contractor shall name, on any policy of insurance required the District, their officers, employees, Construction Manager, Architect, and all other Agents and Representatives as additional insureds. Subcontractors shall name the Contractor, the District, their officers, employees, Construction Manager, Architect, and all other Agents and Representatives as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall state that coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance that is applicable to the loss, such other insurance shall be on an excess or contingent basis. The insurance provided by the Contractor must be designated in the policy as primary to any insurance obtained by the District. The amount of the insurer’s liability shall not be reduced by the existence of such other insurance.

9. Public Contract Code Section 22300 permits the substitution of securities for any retention monies withheld by the DISTRICT to ensure performance under this Agreement. At the request and expense of the CONTRACTOR, securities equivalent to the monies withheld shall be deposited with the DISTRICT, or with a state or federally chartered bank in California as the escrow agent, who shall then pay such monies to the CONTRACTOR. The DISTRICT retains the sole discretion to approve the bank selected by the CONTRACTOR to serve as escrow agent. Upon satisfactory completion of the Agreement, the securities shall be returned to the CONTRACTOR. Securities eligible for investment shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The CONTRACTOR shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

In the alternative, under Section 22300, the CONTRACTOR may request DISTRICT to make payment of earned retention monies directly to the escrow agent at the expense of the CONTRACTOR. Also at the CONTRACTOR's expense, the CONTRACTOR may direct investment of the payments into securities, and the CONTRACTOR shall receive interest earned on such investment upon the same conditions as provided for securities deposited by CONTRACTOR. Upon satisfactory completion of the Agreement, CONTRACTOR shall receive from the escrow agent all securities, interest and payments received by escrow agent from DISTRICT pursuant to the terms of Section 22300.

10. If CONTRACTOR is a corporation, the undersigned hereby represents and warrants that the corporation is duly incorporated and in good standing in the State of________________________, and that________________________, whose title is________________________, is authorized to act for and bind the corporation.

11. Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and
if through mistake or otherwise any such provision is not inserted, or is not currently inserted, then upon application of either party the Agreement shall forthwith be physically amended to make such insertion or correction.

12. This Agreement constitutes the entire agreement of the parties. No other agreements, oral or written, pertaining to the work to be performed, exists between the parties. This Agreement can be modified only by an amendment in writing, signed by both parties and pursuant to action of the Governing Board of the District. This Agreement shall be governed by the laws of the State of California.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed.

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<th>DISTRICT</th>
<th>CONTRACTOR</th>
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<td>(CORPORATE SEAL OF CONTRACTOR, if corporation)</td>
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This Escrow Agreement is made and entered into, as of ________________, 20_____, by and between South Orange County Community College District, whose address is 28000 Marguerite Parkway, Mission Viejo, CA 92692 hereinafter called "DISTRICT;" ________________________ whose address is ______________________________________________________________________, hereinafter called "Contractor;" and, ________________________ whose address is ______________________________________________________________________, hereinafter called "Escrow Agent."

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

(1) Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by DISTRICT pursuant to the Agreement entered into between the DISTRICT and Contractor for ________ in the amount of ________________ dated ________________ (hereinafter referred to as the "Agreement"). Alternatively, on written request of the Contractor, the DISTRICT shall make payments of the retention earnings directly to the Escrow Agent. When the Contractor deposits the securities as a substitute for retention earnings, the Escrow Agent shall notify the DISTRICT within ten (10) days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Agreement between the DISTRICT and Contractor. Securities shall be held in the name of DISTRICT, and shall designate the Contractor as the beneficial owner.

(2) The DISTRICT shall make progress payments to the Contractor for those funds which otherwise would be withheld from progress payments, provided that the Escrow Agent holds securities in the form and amount specified above.

(3) When the DISTRICT makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until the time the escrow created under this Escrow Agreement is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the DISTRICT pays the Escrow Agent directly.

(4) Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the DISTRICT. These expenses and payment terms shall be determined by the DISTRICT, Contractor and Escrow Agent.

(5) The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the DISTRICT.

(6) Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from the DISTRICT to the Escrow Agent that DISTRICT consents to the withdrawal of the amount sought to be withdrawn by Contractor.
(7) The DISTRICT shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven (7) days' written notice to the Escrow Agent from the DISTRICT of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the DISTRICT.

(8) Upon receipt of written notification from the DISTRICT certifying that the Agreement is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Agreement, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

(9) Escrow Agent shall rely on the written notifications from the DISTRICT and the Contractor pursuant to Sections (5) to (8), inclusive, of this Escrow Agreement and the DISTRICT and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

(10) The names of the persons who are authorized to give written notice or to receive written notice on behalf of the DISTRICT and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of DISTRICT:                        On behalf of Contractor:

__________________________________________  __________________________________________
Title                                                                                      Title

__________________________________________  __________________________________________
Name                                                                                      Name

__________________________________________  __________________________________________
Signature                                                                                  Signature

__________________________________________  __________________________________________
Address                                                                                    Address
On behalf of Escrow Agent:

Title

Name

Signature

Address

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

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

DISTRICT                                                                 CONTRACTOR

Title                                                                 Title

Name                                                                 Name

Signature                                                             Signature

Escrow Agent

Title

Name

Signature
GUARANTEE

Guarantee for__________________. We hereby guarantee that the__________________, which we have installed in__________________, has been done in accordance with the Project Documents and that the work as installed will fulfill the requirements included in the Project Documents. The undersigned agrees to repair or replace any or all of such work, together with any other adjacent work which may be displaced in connection with such repair or replacement, that may prove to be defective in workmanship or material within a period of one (1) year from the date of completion of the Project, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of the undersigned's or undersigned surety's failure to commence and pursue with diligence said repairs or replacements within ten (10) calendar days after being notified in writing by the DISTRICT, the undersigned authorizes the DISTRICT to proceed to have said defects repaired or replaced and made good at the expense of the undersigned and surety who hereby agree to pay the costs and charges therefore immediately upon demand. (General Conditions Article 47(d))

________________________________________________________________________

Name of Contractor

By: ___________________________________________________________________

Signature of Contractor

________________________________________________________________________

Print Name

________________________________________________________________________

Title

Contractor shall provide copy of this Guarantee to Contractor’s surety.
Guarantee (continued)

Name of Subcontractor
(if work performed by subcontractor)

By: ________________________________
Signature of Subcontractor

______________________________
Print Name

______________________________
Title

Representatives to be contacted for service:

Name: ________________________________

Address: ________________________________

Telephone: ________________________________
The procedure governing shop drawing submittals is contained in the General Conditions. In addition, all Supplemental Conditions, Special Conditions and Specifications must be followed by the CONTRACTOR.

Failure to comply with all requirements will constitute grounds for return of the shop drawing for proper resubmittal. CONTRACTOR shall sequentially number each submittal.

Date: ___________________________  Submittal No.: ___________________________

From: ___________________________  To: ___________________________

Project Name: ___________________________

This is a(n):  
   Original  ___________________
   Submittal  ___________________
   2nd Submittal  ___________________
   [ ] Submittal  ___________________

Subject of Submittal: ___________________________  Equipment Designation: ___________________________  Specification Section(s): ___________________________

Complete either (a) or (b)  
Check One:

(a) We have verified that the material or equipment contained in this submittal meets all the requirements specified or shown (no exceptions).

(b) We have verified that the material or equipment contained in this submittal meets all the requirements specified or shown, except for the following deviations (List deviations on an attached sheet).
The CONTRACTOR has reviewed and approved not only the field dimensions but the construction criteria and has also made written notation regarding any information in the shop drawings that does not conform to the Project Documents. This shop drawing has been coordinated with all other shop drawings received to date by CONTRACTOR and this duty of coordination has not been delegated to subcontractors, material suppliers, the ARCHITECT, or the engineers on this Project.

Signature of Contractor or Supplier
This Drug-Free Workplace Certification is required pursuant to Government Code Sections 8350, et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract for the procurement of any property or services from any State agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract awarded by a State agency may be subject to suspension of payments or termination of the contract and the contractor may be subject to debarment from future contracting, if the state agency determines that specified acts have occurred.

Pursuant to Government Code Section 8355, every person or organization awarded a contract from a State agency shall certify that it will provide a drug-free workplace by doing all of the following:

a) publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition;

b) establishing a drug-free awareness program to inform employees about all of the following:
   1) the dangers of drug abuse in the workplace;
   2) the person's or organization's policy of maintaining a drug-free workplace;
   3) the availability of drug counseling, rehabilitation and employee-assistance programs;
   4) the penalties that may be imposed upon employees for drug abuse violations;

c) requiring that each employee engaged in the performance of the contract be given a copy of the statement required by subdivision (a) and that, as a condition of employment on the contract, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code Section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the contract be given a copy of the statement required by Section 8355(a) and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the DISTRICT determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of Section 8355, that the contract awarded herein is subject to suspension of payments, termination, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of Section 8350, et seq.
I acknowledge that I am aware of the provisions of Government Code Section 8350, et seq. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

NAME OF CONTRACTOR

__________________________________________

Signature

__________________________________________

Print Name

__________________________________________

Title

__________________________________________

Date
CHANGE ORDER NO. ___________ (ADDITIVE)

PROJECT: ____________________________________________________________

TO: ______________________________________________________________

You are hereby directed to provide the extra work necessary to comply with this Change Order.

DESCRIPTION OF CHANGE: _______________________________________

_________________________________________________________________

COST (This cost shall not be exceeded.):

  Original contract price: $ _______________

  Change Order amount: $ _______________

  New contract price: $ _______________

TIME FOR COMPLETION:

  Original completion date: _______________

  Time for completion of Change Order: _______________

  New completion date: _______________

Contractor agrees to perform the above-described work in accordance with the above terms and in compliance with applicable sections of the Project Documents. The amount of the charges under this Change Order is limited to the charges allowed under Article 60 of the General Conditions. The adjustment in the contract sum, if any, and the adjustment in the contract time, if any, set out in this Change Order shall constitute the entire compensation and/or adjustment in the contract time due Contractor arising out of the change in the work covered by this Change Order, unless otherwise provided in this Change Order.

No additions or deletions to this Change Order shall be allowed, except with written permission of District. Contractor accepts the terms and conditions stated above as full and final settlement of any and all claims arising from this Change Order.

(continued on next page)
This Change Order is hereby agreed to, accepted and approved.

CONTRACTOR

By: ________________________________  
    Signature

Print Name

Title

Date

DISTRICT

By: ________________________________  
    Signature

Print Name

Title

Date

ARCHITECT

By: ________________________________  
    Signature

Print Name

Title

Date
CHANGE ORDER NO. ____________________  (DEDUCTIVE)

PROJECT: ____________________________________________________________

TO: ________________________________________________________________
You are hereby directed to comply with this Change Order.

DESCRIPTION OF CHANGE: __________________________________________

____________________________________________________________________

____________________________________________________________________

COST (This cost shall be deleted.):

Original contract price:  $ __________________
Change Order amount:  $ __________________
New contract price:  $ __________________

TIME FOR COMPLETION:

Original completion date:  __________________
Time for completion of  Change Order:  __________________
New completion date:  __________________

Contractor agrees to deduct the above-described work in accordance with the above terms and in compliance with applicable sections of the Project Documents. Contractor agrees to the adjustment in the contract sum, if any, and the adjustment in the contract time, if any, set out in this Change Order.

No additions or deletions to this Change Order shall be allowed, except with written permission of District. Contractor accepts the terms and conditions stated above as full and final settlement of any and all claims arising from this Change Order.

(continued on next page)
This Change Order is hereby agreed to, accepted and approved.

CONTRACTOR

By: ________________________________

______________________________
Print Name

______________________________
Title

______________________________
Date

DISTRICT

By: ________________________________

______________________________
Print Name

______________________________
Title

______________________________
Date

ARCHITECT

By: ________________________________

______________________________
Signature

______________________________
Print Name

______________________________
Title

______________________________
Date
CONTRACTOR’S CERTIFICATE REGARDING NON-ASBESTOS CONTAINING MATERIALS

Per Article 70 of the General Conditions.

Certification for ___________________. We hereby certify that no Asbestos, or Asbestos Containing Materials shall be used in this Project or in any tools, devices, clothing, or equipment used to affect the ____________ which we have installed in the South Orange County Community College District under Project/Bid No. ___

______________

(a) The Contractor further certifies that he/she has instructed his/her employees with respect to the above mentioned standards, hazards, risks and liabilities.

(b) Asbestos and/or asbestos containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite and actinolite.

(c) Any or all material containing greater than one-tenth of one percent (.1%) asbestos shall be defined as asbestos containing material.

(d) Any disputes involving the question of whether or not material contains asbestos shall be settled by electron microscopy. The costs of any such tests shall be paid by the Contractor if the material is found to contain asbestos.

(e) All work or materials found to contain asbestos or work or material installed with asbestos containing equipment will be immediately rejected and this work will be removed at no additional cost to the District.

__________________________

Date

__________________________

Name of Contractor

By: ________________________

Signature

__________________________

Print Name

__________________________

Title
GENERAL CONDITIONS
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ARTICLE 1.  DEFINITIONS

(a) Action of the Governing Board is a vote of a majority of the members in a lawful meeting.

(b) Addenda are the changes in plans, specifications, drawings, and/or Project Documents which have been authorized in writing by the DISTRICT or ARCHITECT, and which alter, explain, or clarify the Project Documents prior to the bid deadline.

(c) Approval means written authorization by ARCHITECT or DISTRICT.

(d) Agreement includes collectively all Project Documents.

(e) Project Documents includes collectively, to wit: Notice Calling for Bids, Information for Bidders, Bid Form, Bid Security, Designation of Subcontractor form, Information Required of Bidder, all prequalification forms submitted pursuant to Public Contract Code Section 20111.5, if any, Noncollusion Affidavit, Workers’ Compensation Certificate, Faithful Performance Bond, Payment Bond, Agreement, Escrow Agreement, Drug-Free Workplace Certification, Change Order forms, Shop Drawing Transmittals form, Insurance Certificates and Endorsements, Guarantee form, Contractor’s Certificate Regarding Non-Asbestos Containing Materials, General Conditions, Supplemental Conditions, if any, Special Conditions, if any, Drawings, Specifications, and all modifications, addenda and amendments thereto. The Project Documents are complementary, and what is called for by any one shall be as binding as if called for by all.

(f) CONTRACTOR or DISTRICT are those mentioned as such in the Agreement. They are treated throughout the Project Documents as if they are of singular number and neuter gender.

(g) DISTRICT is the Governing Board or its duly authorized representative.

(h) Locality in which the work is performed means the county and city in which the work is done.

(i) Project is the planned undertaking as provided for in the Project Documents by DISTRICT and CONTRACTOR.

(j) Provide shall include “provide complete in place,” that is, “furnish and install.”

(k) Safety Orders are those issued by the Division of Industrial Safety and OSHA safety and health standards for construction.

(l) Standards, Rules, and Regulations referred to are recognized printed standards and shall be considered as one and a part of these specifications within limits specified.
(m) **Subcontractor**, as used herein, includes those having a direct contractual relationship with CONTRACTOR and one who furnishes material worked to a special design according to plans, drawings, and specifications, but does not include one who merely furnishes material not so worked.

(n) **Surety** is the person, firm, or corporation that executes as a California admitted surety insurer, the CONTRACTOR's Bid Security, faithful performance bond and payment bond.

(o) **Work** of the CONTRACTOR or subcontractor includes labor or materials (including, without limitation, equipment and appliances) or both, incorporated in, or to be incorporated in the Project.

(p) **Workers** includes laborer, worker, or mechanic.

**ARTICLE 2. STATUS OF CONTRACTOR**

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

(b) Contractors are required by law to be licensed and regulated by the Contractors' State License Board. Any CONTRACTOR not so licensed is subject to penalties under the law, and the contract will be considered void pursuant to Section 7028.7 of the Business and Professions Code. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, 9821 Business Park Drive, P. O. Box 26000, Sacramento, CA 95826.

(c) Contractor shall possess and maintain all state Contractor’s license and local business licenses as required for the full duration of the project construction period.

**ARTICLE 3. CHANGE IN NAME AND NATURE OF CONTRACTOR’S LEGAL ENTITY**

Before CONTRACTOR makes any change in the name or legal nature of the CONTRACTOR’s entity, CONTRACTOR shall first notify the DISTRICT in writing and cooperate with DISTRICT in making such changes as the DISTRICT may request in the Project Documents.

**ARTICLE 4. CONTRACTOR’S SUPERVISION, PROSECUTION AND PROGRESS**

(a) During progress of the work, CONTRACTOR shall keep on the work site a competent superintendent satisfactory to DISTRICT. Before commencing the work herein, CONTRACTOR shall give written notice to
DISTRICT and ARCHITECT of the name, contact information for access during works hours and after hours in
the event of an emergency, qualifications and experience of such superintendent. If Superintendent is found
unsatisfactory by DISTRICT, CONTRACTOR shall replace the Superintendent with one acceptable to the
DISTRICT. Superintendent shall not be changed except with written consent of DISTRICT, unless a
superintendent proves to be unsatisfactory to CONTRACTOR and ceases to be in its employ, in which case,
CONTRACTOR shall notify DISTRICT and ARCHITECT in writing and replace said Superintendent with one
acceptable to the DISTRICT. Superintendent shall represent CONTRACTOR and all directions given to
Superintendent shall be as binding as if given to CONTRACTOR.

(b) CONTRACTOR shall supervise and direct the work competently and efficiently, devoting such
attention thereto and applying such skills as may be necessary to perform the work in accordance with the
Project Documents. CONTRACTOR shall carefully study and compare all plans, drawings, specifications, and
other instructions and shall at once report to ARCHITECT any error, inconsistency or omission which
CONTRACTOR or its employees may discover. The CONTRACTOR represents itself to DISTRICT as a
skilled, knowledgeable, and experienced CONTRACTOR. The CONTRACTOR shall carefully study and
compare the Project Documents with each other, and shall at once report to the ARCHITECT any errors,
inconsistencies, or omissions discovered. The CONTRACTOR shall be liable to the DISTRICT for damage
resulting from errors, inconsistencies, or omissions in the Project Documents that the CONTRACTOR
recognized and which CONTRACTOR knowingly failed to report and which a similarly skilled,
knowledgeable, and experienced contractor would have discovered.

(c) The CONTRACTOR shall verify all indicated dimensions before ordering materials or equipment, or
before performing work. The CONTRACTOR shall take field measurements, verify field conditions, and shall
carefully compare such field measurements and conditions and other information known to the CONTRACTOR
with the Project Documents before commencing work. Errors, inconsistencies or omissions discovered shall be
reported to the DISTRICT at once. Upon commencement of any item of work, the CONTRACTOR shall be
responsible for dimensions related to such item of work and shall make any corrections necessary to make work
properly fit at no additional cost to DISTRICT. This responsibility for verification of dimensions is a non-
delegable duty and may not be delegated to subcontractors or agents.

(d) Omissions from the plans, drawings or specifications, or the misdescription of details of work which
are manifestly necessary to carry out the intent of the plans, drawings and specifications, or which are
customarily performed, shall not relieve the CONTRACTOR from performing such omitted or misdescribed
work, but they shall be performed as if fully and correctly set forth and described in the plans, drawings and
specifications.

(e) The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and
procedures of construction. The CONTRACTOR shall be responsible to see that the finished work complies
accurately with the Project Documents.

ARTICLE 5. SUBCONTRACTORS

(a) CONTRACTOR agrees to bind every subcontractor by terms of the Project Documents as far as such
terms are applicable to subcontractor’s work. If CONTRACTOR shall subcontract any part of the work,
CONTRACTOR shall be as fully responsible to DISTRICT for acts and omissions of any subcontractor and of
persons either directly or indirectly employed by any subcontractor, as it is for acts and omissions of persons
directly employed by CONTRACTOR. Nothing contained in Project Documents shall create any contractual relation between any subcontractor and DISTRICT, nor shall the contract documents be construed to be for the benefit of any subcontractor.

(b) DISTRICT’s consent to any subcontractor shall not in any way relieve CONTRACTOR of any obligations under the Project Documents and no such consent shall be deemed to waive any provision of any Project Document.

(c) CONTRACTOR must submit with its bid, a Designation of Subcontractors pursuant to the Subletting and Subcontracting Fair Practices Act. If CONTRACTOR specifies more than one subcontractor for the same portion of work or fails to specify a subcontractor, and such portion of the work exceeds one-half of one percent of the total bid, CONTRACTOR agrees that it is fully qualified to perform and shall perform such work itself, unless CONTRACTOR provides for substitution or addition of subcontractors. Substitution or addition of subcontractors shall be permitted only as authorized under the Subletting and Subcontracting Fair Practices Act, Public Contract Code Section 4100, et. seq.

(d) In accordance with Business and Professions Code Section 7059, if CONTRACTOR is designated as a "specialty contractor" (as defined in Section 7058 of the Public Contract Code), all of the work to be performed outside of the CONTRACTOR’s license specialty shall be performed by a licensed subcontractor in compliance with the Subletting and Subcontracting Fair Practices Act, Public Contract Code Section 4100, et seq.

(e) A copy of each subcontract, if in writing, or, if not in writing, then a written statement signed by the CONTRACTOR giving the name of the subcontractor and the terms and conditions of such subcontract, shall be filed with the DISTRICT before the subcontractor begins work. Each subcontract shall contain a reference to the Agreement between the DISTRICT and the CONTRACTOR and the terms of that Agreement and all parts of the Project Documents shall be made a part of such subcontract insofar as applicable to the work covered thereby. Each subcontract will provide for termination in accordance with Article 13 of these General Conditions. Each subcontract shall provide for its annulment by the CONTRACTOR at the order of the ARCHITECT if in the ARCHITECT’S opinion the subcontractor fails to comply with the requirements of the Project Documents insofar as the same may be applicable to this work. Nothing herein contained shall relieve the CONTRACTOR of any liability or obligation hereunder.

ARTICLE 6. PROHIBITED INTERESTS

No official of DISTRICT who is authorized in such capacity and on behalf of DISTRICT to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the Project, shall become directly or indirectly interested financially in this Project or in any part thereof. No officer, employee, architect, attorney, engineer or inspector of or for DISTRICT who is authorized in such capacity and on behalf of DISTRICT to exercise any executive, supervisory or other similar functions in connection with construction of Project shall become directly or indirectly interested financially in this Project or in any part thereof. CONTRACTOR shall receive no compensation and shall repay DISTRICT for any compensation received by CONTRACTOR hereunder, should CONTRACTOR aid, abet or knowingly participate in violation of this Article 6.
ARTICLE 7. DISTRICT’S INSPECTOR

(a) One or more Inspector(s), including special inspectors, as required, will be employed by DISTRICT and will be assigned to the Project.

(b) No work shall be performed by the CONTRACTOR solely upon the instructions or comments by the Inspector. The Inspector has no authority to interpret the Project Documents or order extra work and any extra work performed without the written instruction of the DISTRICT shall be at CONTRACTOR’s sole cost and expense and there will be no delay damages incurred by DISTRICT for such work.

(c) No work shall be carried on except with the knowledge and under the inspection of said Inspector(s). He/she shall have free access to any or all parts of work at any time. CONTRACTOR shall furnish Inspector reasonable opportunities for obtaining such information as may be necessary to keep Inspector fully informed respecting progress and manner of work and character of materials. Inspection of work shall not relieve CONTRACTOR from any obligation to fulfill the Project Documents. Inspector or ARCHITECT shall have authority to stop work whenever provisions of Project Documents are not being complied with and such noncompliance is discovered. CONTRACTOR shall instruct its employees accordingly.

(d) CONTRACTOR understands and agrees that the Inspector for the Project may also serve concurrently as inspector for other DISTRICT projects and may not therefore be available on site during the entire work day. It shall be the responsibility of CONTRACTOR to notify the Inspector not less than twenty-four (24) hours in advance of materials and equipment deliveries and required inspections specific to the Project inspector.

ARTICLE 8. ARCHITECT’S STATUS

(a) The ARCHITECT shall be the DISTRICT’s representative during construction and shall observe the progress and quality of the work on behalf of the DISTRICT. ARCHITECT shall have the authority to act on behalf of DISTRICT only to the extent expressly provided in the Project Documents. ARCHITECT shall have authority to stop work whenever such stoppage may be necessary in ARCHITECT’S reasonable opinion to ensure the proper execution of the Project Documents.

(b) The ARCHITECT shall be, in the first instance, the judge of the performance of the work. ARCHITECT shall exercise authority under the Project Documents to enforce CONTRACTOR’s faithful performance.

(c) The ARCHITECT shall have all authority and responsibility established by law. The ARCHITECT has the authority to enforce compliance with the Project Documents and the CONTRACTOR shall promptly comply with instructions from the ARCHITECT or an authorized representative of the ARCHITECT.

(d) On all questions related to the quantities, the acceptability of material, equipment or workmanship, the execution, progress or sequence of work, the interpretation of plans, specifications or drawings, and the acceptable performance of the CONTRACTOR pursuant to the decision of the ARCHITECT shall govern and shall be precedent to any payment unless otherwise ordered by the Governing Board. The progress and
completion of the work shall not be impaired or delayed by virtue of any question or dispute arising out of or related to the foregoing matters and the instructions of the ARCHITECT relating thereto.

(c) General supervision and direction of the work by the ARCHITECT shall in no way imply that the ARCHITECT or his or her representatives are in any way responsible for the safety of the CONTRACTOR or its employees or that the ARCHITECT or his or her representatives will maintain supervision over the CONTRACTOR’s construction methods or personnel other than to ensure that the quality of the finished work is in accordance with the Project Documents.

ARTICLE 9. NOTICE OF TAXABLE POSSESSORY INTEREST

The terms of the Agreement may result in the creation of a possessory interest. If such a possessory interest is vested in a private party to the Agreement, the private party may be subjected to the payment of property taxes levied on such interest.

ARTICLE 10. ASSIGNMENT OF ANTITRUST ACTIONS

Public Contract Code Section 7103.5 provides:

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

CONTRACTOR, for itself and all subcontractors, agrees to assign to DISTRICT all rights, title, and interest in and to all such causes of action CONTRACTOR and all subcontractors may have under the Agreement. This assignment shall become effective at the time DISTRICT tenders final payment to the CONTRACTOR and CONTRACTOR shall require assignments from all subcontractors to comply herewith.

ARTICLE 11. OTHER CONTRACTS

(a) DISTRICT reserves the right to let other contracts in connection with this work. CONTRACTOR shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly connect and coordinate its work with such other contractors.

(b) If any part of CONTRACTOR’s work depends for proper execution or results upon work of any other contractor, the CONTRACTOR shall inspect and promptly report to ARCHITECT in writing any defects in such work that render it unsuitable for such proper execution and results. CONTRACTOR will be held
accountable for damages to DISTRICT for that work which it failed to inspect or should have inspected. CONTRACTOR's failure to inspect and report shall constitute its acceptance of other contractor's work as fit and proper for reception of its work, except as to defects which may develop in other contractors' work after execution of CONTRACTOR's work.

(c) To ensure proper execution of its subsequent work, CONTRACTOR shall measure and inspect work already in place and shall at once report to the ARCHITECT in writing any discrepancy between executed work and Project Documents.

(d) CONTRACTOR shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by DISTRICT in prosecution of the Project to the end that CONTRACTOR may perform this Agreement in the light of such other contracts, if any.

(e) Nothing herein contained shall be interpreted as granting to CONTRACTOR exclusive occupancy at site of Project. CONTRACTOR shall not cause any unnecessary hindrance or delay to any other contractor working on Project. If simultaneous execution of any contract for Project is likely to cause interference with performance of some other contract or contracts, DISTRICT shall decide which contractor shall cease work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously.

(f) DISTRICT shall not be responsible for any damages suffered or extra costs incurred by CONTRACTOR resulting directly or indirectly from award or performance or attempted performance of any other contract or contracts on Project, or caused by any decision or omission of DISTRICT respecting the order of precedence in performance of contracts.

ARTICLE 12. OCCUPANCY

(a) DISTRICT reserves the right to occupy buildings and/or portions of the site at any time before completion, and such occupancy shall not constitute final acceptance of any part of work covered by this Agreement, nor shall such occupancy extend the date specified for completion of the work. Beneficial occupancy of building(s) does not commence any warranty period nor shall it entitle CONTRACTOR to any additional compensation due to such occupancy.

ARTICLE 13. DISTRICT'S RIGHT TO TERMINATE AGREEMENT

(a) Termination for Cause. If the CONTRACTOR refuses or fails to complete the work or any separable part thereof with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or if the CONTRACTOR should file a petition for relief as a debtor, or should relief be ordered against CONTRACTOR as a debtor under Title 11 of the United States Code, or if CONTRACTOR should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if it should refuse or should fail to supply enough properly skilled workers or proper equipment, tools, and materials in the necessary quantity and quality to complete the work in the time specified, or if CONTRACTOR should fail to make prompt payment to subcontractors for materials or labor, or disregard laws or ordinances or instructions of DISTRICT, or if CONTRACTOR or its subcontractors should otherwise be guilty of a violation of any provision of this Agreement, then
CONTRACTOR shall be deemed to be in default of the Agreement and DISTRICT may, without prejudice to any other right or remedy, serve written notice upon CONTRACTOR and its surety of DISTRICT’s intention to terminate this Agreement, such notice to contain the reasons for such intention to terminate, and unless within ten (10) calendar days after the service of such notice such condition shall cease or such violation shall cease, or arrangements satisfactory to DISTRICT for the correction thereof be made and corrective action commenced in a diligent and workmanlike manner and pursued to satisfactory completion, this Agreement shall upon the expiration of said ten (10) calendar days, cease and terminate. In such case, CONTRACTOR shall be excluded from the worksite and not be entitled to receive any further payment until work is finished to DISTRICT’s satisfaction.

(b) In the event of any such termination, surety shall have the right to take over and perform this Agreement, provided, however, that if surety within five (5) calendar days after service upon it of said notice of termination does not give DISTRICT written notice of its intention to take over and perform this Agreement or does not commence performance thereof within ten (10) calendar days after date of serving such notice of termination by DISTRICT on surety, DISTRICT may take over the work and prosecute same to completion by any means determined by DISTRICT including hiring another contractor for the account and at the expense of CONTRACTOR, and CONTRACTOR and its surety shall be liable to DISTRICT for any excess cost or other damages occasioned by the DISTRICT thereby. Time is of the essence in this Agreement. If the DISTRICT takes over the work as hereinafore provided, the DISTRICT may, without liability for so doing, take possession of and utilize in completing the work such materials, supplies, equipment and other property belonging to the CONTRACTOR as may be on the site of the work and necessary therefore.

(c) The expense of finishing the work, including compensation for additional architectural, managerial, and administrative services, shall be a charge against CONTRACTOR and CONTRACTOR agrees that the charge may be deducted from any money due or becoming due to CONTRACTOR from DISTRICT or CONTRACTOR shall pay the charge to the DISTRICT. Expense incurred by DISTRICT as herein provided, and damage incurred through CONTRACTOR’s default, shall be certified to DISTRICT by ARCHITECT. The surety shall become liable for payment should CONTRACTOR fail to pay in full any cost incurred by the DISTRICT.

(d) Nonappropriation of Funds/Insufficient Funds. In the event that sufficient funds are not appropriated to complete the Project or the DISTRICT determines that sufficient funds are not available to complete the Project, DISTRICT may terminate or suspend the completion of the Project at any time by giving written notice to the CONTRACTOR. In the event that the DISTRICT exercises this option, the DISTRICT shall pay for any and all work and materials completed or delivered onto the site, and the value of any and all work then in progress and orders actually placed which cannot be canceled up to the date of notice of termination. The value of work and materials paid for shall include a factor of fifteen percent (15%) for the CONTRACTOR's overhead and profit and there shall be no other costs or expenses paid to CONTRACTOR. All work, materials and orders paid for pursuant to this provision shall become the property of the DISTRICT. DISTRICT may, without cause, order CONTRACTOR in writing to suspend, delay or interrupt the Project in whole or in part for such period of time as DISTRICT may determine. Adjustment shall be made for increases in the cost of performance of the Agreement caused by suspense, delay or interruption.

(e) The foregoing provisions are in addition to and not a limitation of any other rights or remedies available to the DISTRICT.
ARTICLE 14. BONDS

Unless otherwise specified in Special Conditions, CONTRACTOR shall furnish a surety bond in an amount equal to one hundred percent (100%) of contract price as security for faithful performance of this Agreement and shall furnish a separate bond in an amount of one hundred percent (100%) of the contract price as security for payment to persons performing labor and furnishing materials in connection with this Project. Bonds shall be in the form set forth in these Project Documents.

ARTICLE 15. SUBSTITUTION OF SECURITIES

(a) Pursuant to the requirements of Public Contract Code Section 22300, upon CONTRACTOR's request, DISTRICT will make payment to CONTRACTOR of any earned retention funds withheld from payments under this Agreement if CONTRACTOR deposits with the DISTRICT or in escrow with a California or federally chartered bank acceptable to DISTRICT, securities eligible for the investment pursuant to Government Code Section 16430 or bank or savings and loan certificates of deposit, upon the following conditions:

1. CONTRACTOR shall be the beneficial owner of any securities substituted for retention funds withheld and shall receive any interest thereon.

2. All expenses relating to the substitution of securities under said Section 22300 and under this Article 15, including, but not limited to DISTRICT’s overhead and administrative expenses, and expenses of escrow agent shall be the responsibility of the CONTRACTOR.

3. If CONTRACTOR shall choose to enter into an escrow agreement, such agreement shall be in the form as set forth in Public Contract Code section 22300(f) attached hereto as part of the Project Documents and which shall allow for the conversion to cash to provide funds to meet defaults by the CONTRACTOR including, but not limited to, termination of the CONTRACTOR's control over the work, stop notices filed pursuant to law, assessment of liquidated damages or amount to be kept or retained under the provisions of the Project Documents.

4. Securities, if any, shall be returned to CONTRACTOR only upon satisfactory completion of the Agreement.

(b) To minimize the expense caused by such substitution of securities, CONTRACTOR shall, prior to or at the time CONTRACTOR requests to substitute security, deposit sufficient security to cover the entire amount to be then withheld and to be withheld under the General Conditions of this Agreement. Should the value of such substituted security at any time fall below the amount for which it was substituted, or any other amount which the DISTRICT determines to withhold, CONTRACTOR shall immediately, and at CONTRACTOR's expense, deposit additional security qualifying under said Section 22300 until the total security deposited is no less than equivalent to the amount subject to withholding under the Agreement.

(c) In the alternative, under Section 22300, CONTRACTOR, at its own expense, may request DISTRICT to make payment of earned retention funds directly to the escrow agent. Also at the expense of CONTRACTOR, CONTRACTOR may direct investment of the payments into securities, and CONTRACTOR
shall receive the interest earned on the investment upon the same conditions as shown in paragraph (a) for
securities deposited by CONTRACTOR. Upon satisfactory completion of the Agreement, CONTRACTOR
shall receive from the escrow agent all securities, interest and payments received by the escrow agent from
DISTRICT, pursuant to the terms of Section 22300.

(d) If any provision of this Article 15 shall be found to be illegal or unenforceable, then, notwithstanding,
this Article 15 shall remain in full force and effect, and such provision shall be deemed stricken.

ARTICLE 16. FIRE INSURANCE

CONTRACTOR will procure at CONTRACTOR's own expense, and before commencement of any work under
this Agreement, fire insurance on the Project. Amount of fire insurance shall be sufficient to protect against
loss or damage in full until work is accepted by DISTRICT. CONTRACTOR shall submit proof of insurance
and shall provide endorsements on forms provided by the DISTRICT or on forms approved by the DISTRICT.

ARTICLE 17. PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

(a) CONTRACTOR shall take out and maintain during the life of this Agreement such public liability and
property damage insurance as shall protect CONTRACTOR and DISTRICT from all claims for personal injury,
including accidental death, to any person (including, as to DISTRICT, injury or death to CONTRACTOR's or
subcontractor's employees), as well as from all claims for property damage arising from operations under this
Agreement, in amounts as set forth in the Agreement.

(b) CONTRACTOR shall require its subcontractors, if any, to take out and maintain similar public liability
and property damage insurance in like amounts or insure the activities of its subcontractors in
CONTRACTOR’s own policy.

(c) CONTRACTOR, during the progress of the work and until final acceptance of the work by DISTRICT
upon completion of the entire Agreement, shall maintain Builder’s Risk/ “All Risk,” course-of-construction
insurance in an amount not less than as set forth in the Agreement. Coverage is to provide extended coverage
and insurance against vandalism, malicious mischief, perils of fire, sprinkler leakage, civil authority, sonic
boom, earthquake, collapse, flood, wind, lightning, smoke, riot, debris removal (including demolition), and
reasonable compensation for ARCHITECT’s services and expenses required as a result of such insured loss
upon the entire work which is the subject of the Project Documents, including completed work and work in
progress to the full insurable amount thereof. The risk of damage to the work due to the perils covered by the
Builder’s Risk/“All Risk” Insurance, as well as any other hazards which might result in damage to the work, is
that of CONTRACTOR and the surety, and no claims for such loss or damage shall be recognized by
DISTRICT nor will such loss or damage excuse the complete and satisfactory performance of the Agreement by
CONTRACTOR.

(d) CONTRACTOR shall submit proof of insurance and shall provide endorsements on the forms
provided by the DISTRICT or on forms approved by the DISTRICT. Such insurance shall be issued by
admitted surety insurers under the same conditions as required for bonds on the Project.
ARTICLE 18. WORKERS' COMPENSATION INSURANCE

(a) In accordance with the provisions of Section 3700 of the Labor Code, the CONTRACTOR and every subcontractor shall be required to secure the payment of compensation to its employees.

(b) The CONTRACTOR shall provide, during the life of the Agreement, workers' compensation insurance for all of its employees engaged in work under this Agreement, on or at the site of the Project, and, in case any of its work is sublet, the CONTRACTOR shall require the subcontractor similarly to provide workers' compensation insurance for all the latter's employees. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the CONTRACTOR's insurance. In case any class of employees engaged in work under this Agreement, on or at the site of the Project, is not protected under the workers' compensation statute, the CONTRACTOR shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected before subcontractor commences work. The CONTRACTOR shall file with the DISTRICT certificates of its insurance protecting workers and a thirty (30) day notice shall be provided to DISTRICT before the cancellation or reduction of any policy of CONTRACTOR or subcontractor. CONTRACTOR shall submit proof of insurance and shall provide endorsements on the forms provided by the DISTRICT or on forms approved by the DISTRICT. Such endorsements shall be submitted concurrently with the Project Documents.

ARTICLE 19. PROOF OF CARRIAGE OF INSURANCE

(a) CONTRACTOR shall not commence work nor shall it allow any subcontractor to commence work under this Agreement until all required insurance certificates and endorsements from admitted surety insurers have been obtained and delivered in duplicate to and approved by DISTRICT. Such insurance shall be issued by admitted surety insurers under the same conditions as required for bonds on the Project. CONTRACTOR shall provide proof of insurance on DISTRICT approved forms without revisions.

(b) Certificates and insurance policies shall include the following:

1. A clause stating:

"This policy shall not be canceled or reduced in required limits of liability or amount of insurance until notice has been mailed to DISTRICT stating date of cancellation or reduction. Date of cancellation or reduction may not be less than thirty (30) days after date of mailing notice."

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

3. Statement that the DISTRICT is an additional insured under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by the DISTRICT.
(c) In case of CONTRACTOR's failure to provide insurance as required by the Agreement, the DISTRICT may, at DISTRICT's option, take out and maintain at the expense of the CONTRACTOR, such insurance in the name of CONTRACTOR, or subcontractor, as the DISTRICT may deem proper and may deduct the cost of taking out and maintaining such insurance from any sums which are due or to become due to the CONTRACTOR under this Agreement.

**ARTICLE 20. DRAWINGS AND SPECIFICATIONS**

(a) Drawings and Specifications are intended to delineate and describe the Project and its component parts to such a degree as will enable skilled and competent contractors to intelligently bid upon the work, and to carry said work to a successful conclusion.

(b) Drawings and Specifications are intended to comply with all laws, ordinances, rules and regulations of constituted authorities having jurisdiction, and where referred to in the Project Documents, said laws, ordinances, rules and regulations shall be considered as a part of the Agreement within the limits specified. The CONTRACTOR shall bear all expenses of correcting work done contrary to said laws, ordinances, rules and regulations and if the CONTRACTOR performed same (1) without first consulting the ARCHITECT for further instructions regarding said work, or (2) disregarded the ARCHITECT'S instructions regarding said work.

(c) Questions regarding interpretation of drawings and specifications shall be clarified by the ARCHITECT. Before commencing any portion of the work, CONTRACTOR shall carefully examine all drawings and specifications and other information given to CONTRACTOR. CONTRACTOR shall immediately notify ARCHITECT and DISTRICT in writing of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the drawings and specifications. If CONTRACTOR or its subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any work under the Project Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, CONTRACTOR shall bear any and all costs arising therefrom including, without limitation, the cost of correction thereof. In the event ARCHITECT determines that CONTRACTOR's requests for clarification or interpretation are not justified or do not reflect adequate competent supervision or knowledge by the CONTRACTOR or his/her subcontractors, CONTRACTOR shall be required to pay ARCHITECT's reasonable and customary fees in processing and responding to such requests. Should the CONTRACTOR commence work or any part thereof without seeking clarification, CONTRACTOR waives any claim for extra work or damages as a result of any ambiguity, conflict or lack of information.

(d) Figured dimensions on drawings shall govern, but work not dimensioned shall be as directed. Work not particularly shown or specified shall be the same as similar parts that are shown or specified. Large-scale drawings shall take precedence over smaller scale drawings as to shape and details of construction. Specifications shall govern as to materials, workmanship, and installation procedures. Drawings and specifications are intended to be fully cooperative and to agree. If CONTRACTOR observes that drawings and specifications are in conflict, CONTRACTOR shall promptly notify the ARCHITECT in writing, and any necessary changes shall be adjusted as provided in the Article entitled "Changes and Extra Work;" provided, however, that the specification calling for the higher quality material or workmanship shall prevail without additional cost to DISTRICT.
(e) Materials or work described in words which so applied has a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

(f) It is not the intention of the Agreement to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of such "trade name" or "trade term" shall be considered a sufficient notice to CONTRACTOR that it will be required to complete the work so named with all its incidental and accessory items according to the best practices of the trade.

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

(h) ARCHITECT will furnish to CONTRACTOR one (1) complete set of blue-line prints for posting of changes. Additional blue-line prints shall be provided by ARCHITECT upon payment by CONTRACTOR. During the construction period, CONTRACTOR shall maintain the set of blue-line prints in a satisfactory record condition, and shall thoroughly and neatly post, as they occur, all additions, deletions, corrections and/or revisions in the actual construction of the Project. The record drawings must be posted monthly and be current prior to each submission of each certificate of payment.

### ARTICLE 21. OWNERSHIP OF DRAWINGS

All plans, drawings, designs, specifications, and other incidental architectural and engineering work or materials and other Project Documents and copies thereof furnished by DISTRICT are DISTRICT’s property. They are not to be used in other work and are to be returned to DISTRICT on request at completion of work, and may be used by DISTRICT as it may require, without any additional costs to DISTRICT.

### ARTICLE 22. DETAIL DRAWINGS AND INSTRUCTIONS

(a) In case of ambiguity, conflict, or lack of information, ARCHITECT shall furnish additional instructions by means of drawings or otherwise, necessary for proper execution of work. All such drawings and instructions shall be consistent with Project Documents, true developments thereof, and reasonably inferable therefrom. Such additional instructions shall be furnished with reasonable promptness, provided that CONTRACTOR informs the ARCHITECT of the relationship of the request to the critical path of construction.

(b) Work shall be executed in conformity therewith and CONTRACTOR shall do no work without proper drawings and instructions.

(c) The ARCHITECT will furnish necessary additional details to more fully explain the work, which details shall be considered as part of the Project Documents.

(d) Should any details be more elaborate, in the opinion of the CONTRACTOR, than scale drawings and specifications warrant, CONTRACTOR shall give written notice thereof to the ARCHITECT within five (5) days of the receipt of same. In case no notice is given to the ARCHITECT within five (5) days, it will be
assumed the details are reasonable development of the scale drawings. In case notice is given, then it will be
considered, and if found justified, the ARCHITECT will either modify the drawings or shall recommend to
DISTRICT a change order for the extra work involved.

(c) All parts of the described and shown construction shall be of the best quality of their respective kinds
and the CONTRACTOR is hereby advised to use all diligence to become fully involved as to the required
construction and finish, and in no case to proceed with the different parts of the work without obtaining first
from the ARCHITECT such directions and/or drawings as may be necessary for the proper performance of the
work.

(f) If it is found at any time, before or after completion of the work, that the CONTRACTOR has varied
from the drawings and/or specifications, in materials, quality, form or finish, or in the amount or value of the
materials and labor used, the ARCHITECT shall make a recommendation: (1) that all such improper work
should be removed, remade and replaced, and all work disturbed by these changes be made good at the
CONTRACTOR's expense; or (2) that the DISTRICT deduct from any amount due CONTRACTOR, the sum
of money equivalent to the difference in value between the work performed and that called for by the drawings
and specifications. ARCHITECT shall determine such difference in value. The DISTRICT, at its option, may
pursue either recommendation made by the ARCHITECT.

ARTICLE 23. SHOP DRAWINGS

(a) CONTRACTOR shall check and verify all field measurements and shall submit to ARCHITECT, with
sufficient advance time, six (6) copies, checked and approved by CONTRACTOR, of all shop drawings,
schedules, and materials list required for the work. All shop drawings, samples, product data, and other
submittal data must be received within fifteen (15) calendar days of receiving the Notice to Proceed.
ARCHITECT shall review such drawings, schedules and materials list only for conformance with design
concept of Project and compliance with information given in Project Documents, and return with guidance as to
required corrections. CONTRACTOR shall make any corrections required by ARCHITECT, file three (3)
corrected copies with ARCHITECT, and furnish such other copies as may be needed for construction within
five (5) calendar days. ARCHITECT’S approval of such drawings, schedules, or materials list shall not relieve
CONTRACTOR from responsibility for deviations unless CONTRACTOR has in writing called
ARCHITECT’S attention to such deviations at time of submission and secured ARCHITECT’S written
approval, nor shall it relieve CONTRACTOR from responsibility for errors in shop drawings or schedules.

(b) All submittals of shop drawings, catalog cuts, data sheets, schedules and material lists shall be
complete and shall conform to contract drawings and specifications. The CONTRACTOR shall prepare, pay for
and print the necessary quantities of shop drawings and submittals as required. Submittal copies shall be neatly
bound with sturdy labeled covers. For each item listed include manufacturer’s name and address, trade name,
local supplier’s name and address, catalog number, catalog cuts and brochures, complete technical and
performance data for machinery and equipment. Mark cuts, brochures, and data to indicate items proposed and
the intended use.

(c) The term "shop drawing" as used herein shall be understood to include, but not be limited to, detail
design calculations, fabrication and installation drawings, lists, graphs and operating instructions.
(d) Shop drawings shall be submitted at a time sufficiently early to allow review of same by the Division of State Architect (DSA) if required, and the ARCHITECT, and to accommodate the rate of construction progress required under the Project Documents. CONTRACTOR will be required to pay ARCHITECT's reasonable and customary fees in order to expedite review of shop drawings which are not submitted in a timely fashion.

(e) All shop drawing submittals shall be accompanied by an accurately completed transmittal form using the format bound herein. Any shop drawing submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned for re-submittal. The CONTRACTOR may authorize a material or equipment supplier to deal directly with the ARCHITECT with regard to shop drawings, however, ultimate responsibility for the accuracy and completeness of the information contained in the submittal shall remain with the CONTRACTOR.

(f) Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of shop drawings on various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. At its option, the CONTRACTOR or Supplier may obtain from the ARCHITECT quantities of the shop drawing transmittal form at reproduction cost.

(g) CONTRACTOR's review and approval of shop drawings shall include the following stamp:

"The CONTRACTOR has reviewed and approved not only the field dimensions but the construction criteria and has also made written notation regarding any information in the shop drawings that does not conform to the Project Documents. This shop drawing has been coordinated with all other shop drawings received to date by CONTRACTOR and this duty of coordination has not been delegated to subcontractors, material suppliers, the ARCHITECT, or the engineers on this project.

____________________________________________
Signature of CONTRACTOR"

(h) Within twenty-five (25) calendar days after receipt of the shop drawings, the ARCHITECT will return one or more prints of each drawing to CONTRACTOR with his or her comments noted thereon. The CONTRACTOR shall make a complete and acceptable submittal to the ARCHITECT by the second submission of drawings. The DISTRICT shall withhold funds due the CONTRACTOR to cover additional costs of the ARCHITECT'S review beyond the second submission and any other costs incurred by DISTRICT.

(i) If prints of the shop drawing are returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN," formal revision of said drawing will not be required. If prints of the drawing are returned to the CONTRACTOR marked "MAKE CORRECTIONS NOTED," formal resubmittal of said drawings will not be required. If prints of the drawing are returned to the CONTRACTOR marked "REVISE AND RESUBMIT,"
the CONTRACTOR shall revise said drawing and shall resubmit six (6) copies of the revised drawing to the
ARCHITECT. If prints of the drawing are returned to the CONTRACTOR marked "REJECTED RESUBMIT,"
the CONTRACTOR shall resubmit six (6) new copies of the drawing to the ARCHITECT.

(j) Fabrication of an item shall not be commenced before the ARCHITECT has reviewed the pertinent
shop drawings and returned copies to the CONTRACTOR marked with "NO EXCEPTIONS TAKEN," or
"MAKE CORRECTIONS NOTED." Revisions indicated on shop drawings shall be considered as changes
necessary to meet the requirements of the Project Documents and shall not be taken as the basis of claims for
extra work. The review of such drawings by the ARCHITECT will be limited to checking for general
agreement with the Project Documents, and shall in no way relieve the CONTRACTOR of responsibility for
errors or omissions contained therein, nor shall such review operate to waive or modify any provision contained
in the Project Documents. Fabricating dimensions, quantities of material, applicable code requirements, and
other contract requirements shall be the CONTRACTOR's responsibility.

(k) No work represented by required shop drawings shall be purchased or commenced until the applicable
submittal has been approved. The work shall conform to the approved shop drawings and all other
requirements of the Project Documents. The CONTRACTOR shall not proceed with any related work which
may be affected by the work covered under shop drawings until the applicable shop drawings have been
approved, particularly where piping, machinery, and equipment and the required arrangements and clearances
are involved.

(l) Except where the preparation of a shop drawing is dependent upon the approval of a prior shop
drawing, all shop drawings pertaining to the same class or portion of the work shall be submitted
simultaneously.

(m) Calculations of a structural nature must be approved by the Division of State Architect.

(n) The CONTRACTOR shall have no claim for damages or extension of time due to any delay resulting
from the CONTRACTOR having to make the required revisions to shop drawings unless review by the
Architect of said drawings is delayed beyond the time provided hereinbefore and the contractor can establish
that the Architect's delay in review actually resulted in a delay in the contractor construction schedule.
Contractor shall not be entitled to any claim for damages resulting from DSA review extending beyond fifteen
(15) calendar days after submittal. However, DISTRICT may consider an extension of time due to any delay
caused by DSA review.

ARTICLE 24. LAYOUT AND FIELD ENGINEERING

All field engineering if required for laying out of work and establishing grades for earthwork operations shall be
furnished by CONTRACTOR at its expense. Such work shall be done by a qualified civil engineer approved by
the DISTRICT.

ARTICLE 25. SOILS INVESTIGATION REPORT
(a) When a soils investigation report has been obtained from test holes at the site, such report is available for the CONTRACTOR’S use for work under this Agreement. Such report shall not be part of the Agreement. Any information obtained from such report or any information given on the project documents as to surface and subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed and does not form a part of the Agreement. CONTRACTOR is required to make a visual examination of site and must make whatever test CONTRACTOR deems appropriate to determine surface and subsurface soil conditions. If, during the course of work under this Agreement, CONTRACTOR encounters subsurface or latent conditions which differ materially from those indicated in the soils investigation report, then CONTRACTOR shall notify the DISTRICT within five (5) working days of discovery of the condition.

**WARNING:** DISTRICT does not warrant the soils at the project site nor any information contained in any soils report. Soils investigation report is provided for CONTRACTOR’S information only. CONTRACTOR must conduct an independent investigation of the project site and the soils conditions of the site. DISTRICT does not warrant the soils conditions of the site and CONTRACTOR is fully responsible to ascertain site conditions for the purposes of determining construction means and methods prior to commencing construction.

(b) CONTRACTOR agrees that no claim against DISTRICT will be made by CONTRACTOR for damages and hereby waives any rights to damages in the event that during progress of work CONTRACTOR encounters subsurface of latent conditions at the worksite materially different from those shown on project documents.

### ARTICLE 26. TESTS AND INSPECTIONS

(a) Tests and inspections will comply with California Code of Regulations and with all other laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction over the Project.

(b) If the Agreement, DISTRICT’s instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, CONTRACTOR shall give notice in accordance with such authority of its readiness for observation or inspection at least two (2) working days prior to being tested or covered up. If inspection is by authority other than DISTRICT, CONTRACTOR shall inform the DISTRICT’s Inspector of the date fixed for such inspection. Required certificates of inspection shall be secured by CONTRACTOR. Observations by DISTRICT’s Inspector shall be promptly made, and where practicable, at source of supply. If any work should be covered up without approval or consent of DISTRICT’s Inspector, it must be uncovered for examination and satisfactorily reconstructed at CONTRACTOR’s expense in compliance with the Agreement. Costs of tests, inspections and any materials found to be not in compliance with the Agreement shall be paid for by CONTRACTOR.

(c) Unless otherwise noted by the contract document, the DISTRICT will pay for testing and inspection costs except for the following conditions listed: Contractor shall pay for resulting costs from:

1. Testing/inspection beyond a normal 8 hour day, weekends or holidays: or uncoordinated requests for inspection; or insufficient notice of work to be performed.
(2) Additional/premium testing and inspection costs due to our of sequence fabrication and erection

(3) Testing/inspection costs due to faulty work and the subsequent rework

(4) Testing/inspection costs which are a result of this CONTRACTOR’S method of installation or use of alternate/non-specific materials that cause additional testing/inspection over normal accepted installation methods and materials testing.

(5) Testing/inspection costs which are incurred due to work that is not ready for complete inspection.

ARTICLE 27. TRENCHES

(a) CONTRACTOR shall provide, maintain and remove adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life and limb in trenches and open excavation, which conform to applicable safety standards.

(b) If this Agreement involves the excavation of any trench or trenches five (5) feet or more in depth, and the Project cost is in excess of $25,000, the CONTRACTOR shall, in advance of excavation, submit to the DISTRICT for acceptance or to whomever DISTRICT designates which may include a registered civil or structural engineer employed by the DISTRICT to whom authority to accept has been delegated, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the Shoring System Standards established by the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered civil or structural engineer employed by the CONTRACTOR, and all costs therefore shall be included in the price named in the Agreement for completion of the work as set forth in the Project Documents. In no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by CAL-OSHA and a CAL-OSHA permit for such plan delivered to the DISTRICT. Labor Code Section 6500 and 6705; Health and Safety Code Section 17922.5)

(c) If this Agreement involves the digging of trenches or excavations that extend deeper than four feet below the surface, the following shall apply pursuant to Public Contract Code section 7104:

(1) The CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the DISTRICT, in writing, of any:

(i) Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

(ii) Subsurface or latent physical conditions at the site different from those indicated.
(iii) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

(2) The DISTRICT shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR’s cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the Project Documents.

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

ARTICLE 28. DOCUMENTS ON WORK

CONTRACTOR shall keep on the job site at all times one legible copy of all Project Documents, including addenda and change orders, and all approved drawings, plans, schedules and specifications. Said Documents shall be kept in good order and available to ARCHITECT, ARCHITECT’s representatives, and all authorities having jurisdiction. CONTRACTOR shall be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project.

ARTICLE 29. STATE AUDIT

Pursuant to and in accordance with the provisions of Government Code Section 8546.7, or any amendments thereto, all books, records and files of the DISTRICT, the CONTRACTOR, or any subcontractor connected with the performance of this Agreement involving the expenditure of public funds in excess of Ten Thousand Dollars ($10,000.00), including, but not limited to, the costs of administration of the Agreement, shall be subject to the examination and audit of the State Auditor at the request of the DISTRICT or as part of any audit of the DISTRICT for a period of three (3) years after final payment is made under this Agreement.

ARTICLE 30. SUBSTITUTIONS

(a) Prior to Bid Opening. Should the bidder wish to request prior to bid opening, any substitution for the materials, process, service or equipment specified, the bidder shall submit a written request at least ten (10) working days before the bid opening date and hour. If the substituted item is acceptable, the DISTRICT will approve it in an Addendum issued to all bidders of record. Requests received less than ten (10) working days prior to bid opening will not be considered. DISTRICT shall only consider substitution requests from the bidder submitting the bid for the project.
(b) **After Bid Opening and Prior to Award of Contract.** If the bidder clearly indicates in its bid that it is proposing to use an “equal” product, the brand name or trade name, if any, of a proposed substitute item shall be inserted in the space provided in the bid or shall be otherwise clearly identified in the bid. **Any submittal provided after the aforementioned deadline will not be considered.** If the bidder fails to indicate an “equal” product, its bid shall be considered as offering the material, process, service or equipment referred to by the brand name or trade name specified. It is expressly understood and agreed to by the bidder that the DISTRICT reserves the right to reject any such proposed substituted item. It is further expressly understood and agreed by bidder that in the event the DISTRICT rejects a proposed “equal” item, the bidder will then supply the material; process, service or equipment designated by brand name or trade name or a substitute therefore which meets with the approval of the DISTRICT.

DISTRICT shall only consider substitution requests from the bidder submitting the bid for the Project. The DISTRICT is not responsible for locating or securing any information which is not included in such substantiating data. The burden of proof as to the quality or suitability of proposed substituted items shall be borne by the bidder. The DISTRICT shall be the sole judge as to the quality and suitability of proposed substituted items, and decisions of the DISTRICT shall be final and conclusive. Unless extended by the mutual agreement of the parties, the DISTRICT shall notify the successful bidder of the decision concerning the proposed substitution of “equal” items prior to the award of the contract. Also such decisions by the DISTRICT shall be in writing, and no proposed substituted item shall be deemed approved unless the DISTRICT has so indicated in writing. These time limitations shall be complied with strictly, and in no case will an extension of time for completion be granted because of the bidder’s failure to request the substitution of an item at the times and in the manner set forth herein.

(c) **Whenever in specifications any materials, process, service or equipment is indicated or specified by brand name, trade name, proprietary name or by name of manufacturer, such specification shall be deemed to be used for the purpose of facilitating description of material, process, service or equipment desired and shall be deemed to be followed by the words "or equal," and CONTRACTOR may, unless otherwise stated, offer any material, process, service, or equipment which shall be substantially equal or better in every respect to that so indicated or specified subject to DISTRICT or ARCHITECT approval.**

(d) **If material, process, service, or equipment offered by CONTRACTOR is not, in opinion of ARCHITECT, or DISTRICT, substantially equal or better in every respect to that specified, then CONTRACTOR shall furnish the material, process, service, or equipment specified. Burden of proof as to equality of any material, process, service, or equipment shall rest with CONTRACTOR. Provision authorizing submission of "or equal" substantiating data shall not in any way authorize an extension of time for performance of this Agreement nor shall DISTRICT or ARCHITECT authorize the submission of "or equal" substantiating data within twenty five (25) days of the filing of the Notice of Completion on the Project.**

(e) **In the event CONTRACTOR furnishes material, process, service or equipment other than what was specified by the DISTRICT and which has been accepted by the DISTRICT and which later is defective, then CONTRACTOR at its sole cost and expense shall furnish the DISTRICT specified material, process, service or equipment or fully replace with new the defective material process, service or equipment at DISTRICT’s discretion.**

(f) **In the event CONTRACTOR furnishes material, process service, or equipment more expensive than that specified, difference in cost of such material, process, service, or equipment so furnished shall be borne by**
CONTRACTOR. Any engineering, design fees, or approval agencies' fees required to make adjustments in material or work of all trades directly or indirectly affected by the approved substituted items shall be borne entirely by CONTRACTOR. Any difference in cost between an approved substitution which is lower in cost than the originally specified item shall be refunded or credited by CONTRACTOR to DISTRICT.

(g) Price, fitness and quality being equal with regard to supplies, the District may prefer supplies grown, manufactured, or produced in California and next prefer supplies partially manufactured grown, or produced in California provided the bids of said suppliers or the prices quoted by them do not exceed by more than 5% of the lowest bids/prices quoted by out of state suppliers, the major portion of the manufacture of the supplies is not done outside of California and the public good will be served thereby. (Government Code section 4330-4334)

(h) Six (6) copies of pertinent information, technical data and a letter identifying the changes shall be issued by the CONTRACTOR when requesting use of alternate materials

ARTICLE 31. SAMPLES

(a) CONTRACTOR shall furnish for approval, within fifteen (15) calendar days following Notice to Proceed, all samples as required in specifications together with catalogs and supporting data required by ARCHITECT. This provision shall not authorize any extension of time for performance of the work. ARCHITECT shall review such samples, as to conformance with design concept of work and for compliance with information given in Project Documents and approve or disapprove same within fifteen (15) calendar days from receipt of same.

(b) Unless specified otherwise, sampling, preparation of samples and tests shall be in accordance with the latest standards of the American Society for Testing and Materials.

(c) Samples shall, upon demand of ARCHITECT or DISTRICT, be submitted for tests or examinations and considered before incorporation of same into the work. CONTRACTOR shall be solely responsible for delays due to samples not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples which are of value after testing will remain the property of the CONTRACTOR.

ARTICLE 32. PROGRESS SCHEDULE

(a) Within five (5) calendar days after being awarded the contract, CONTRACTOR shall submit a progress schedule for DISTRICT’s acceptance. The schedule shall indicate the beginning and completion dates of all phases of construction and shall use the "critical path method" (commonly called CPM) or equivalent scheduling methodology for the value reporting, planning and scheduling, of all work required under the Project Documents. The schedule will separately identify those milestones or events that must be completed before other portions of the work can be accomplished with no activity exceeding a 14 day duration.

(b) The scheduling is necessary for the DISTRICT’s adequate monitoring of the progress of the work and shall be prepared in accordance with the time frame described in Article 4 of the Agreement. The DISTRICT
may reject such a schedule and require modification to it if, in the opinion of the ARCHITECT or DISTRICT, adherence to the progress schedule will cause the work not to be completed in accordance with the Agreement. CONTRACTOR shall adhere to any such modifications required by the DISTRICT.

(c) CONTRACTOR will exchange scheduling information with subcontractors and suppliers. CONTRACTOR will order work, equipment and materials with sufficient lead time to avoid interruption of the work.

(d) The CONTRACTOR shall submit to DISTRICT a monthly schedule to reflect the actual sequence of the work which shall be totally separate and apart from the original progress schedule.

(e) The CONTRACTOR shall also, if requested by the ARCHITECT or DISTRICT, provide revised schedules within ten (10) calendar days if, at any time, the ARCHITECT or DISTRICT, consider the completion date to be in jeopardy. The revised schedule shall be designed to show how the CONTRACTOR intends to accomplish the work to meet the original completion date. The form and method employed by the CONTRACTOR shall be the same as for the original progress schedule. The CONTRACTOR shall modify any portions of the schedule that become infeasible because of "activities behind schedule" or for any other valid reason. CONTRACTOR will provide documents and justification for any schedule changes. An activity that cannot be completed by its original completion date shall be deemed to be behind schedule.

(f) CONTRACTOR shall submit a revised schedule within ten (10) consecutive calendar days of CONTRACTOR’s request for any extension of time. Failure to submit such schedule will result in CONTRACTOR waiving his/her right to obtain any extension of time.

(g) It is agreed that the DISTRICT owns the “float” on this project. If CONTRACTOR submits a revised schedule showing an earlier completion date for the project, DISTRICT’s acceptance of this revised schedule shall not entitle contractor to any delay claim or disruption damages or any other damages due to any such revised schedule. Nothing provided herein shall be construed as a direct, indirect or implicit acceleration order to the contractor.

(h) CONTRACTOR agrees that failure to timely submit the progress schedule, the monthly schedule or any revised progress schedule requested by the ARCHITECT or the DISTRICT may result in delay in payment to CONTRACTOR.

(i) In addition to the requirement to update the baseline schedule, CONTRACTOR is responsible to provide a three week look-ahead schedule at each progress meeting. Schedule will include activities that are being completed during the week of the meeting and projected work for two weeks out. Schedule will include information for all trades on-site. Schedule will identify any work that is proposed outside the regular working hours.

ARTICLE 33. TIME ALLOWANCES

(a) DISTRICT will serve a Notice to Proceed upon Contractor by hand delivery, facsimile, email or delivery to Contractor at legal address.
(b) Start date for Contract Times shall be on the date indicated in the Notice to Proceed. If no date is indicated, then the start date for contract time shall be the 5th calendar day from date that Contractor receives DISTRIBUTION'S written Notice to Proceed, unless the Notice to Proceed is served by mail only, then the Start Date under the Contract shall be the tenth (10th) calendar day following the date of mailing. The Contractor shall commence work on such day, and shall prosecute the Work diligently to completion thereafter. No work shall commence before contract bonds and insurance certificates have been filed with the DISTRIBUTION and the contract has been signed by the DISTRIBUTION.

(c) CHANGE OF CONTRACT TIMES

(1) The contract times may only be changed by change order or written amendment and time is of this essence in this Agreement.

(2) The Contract Times will be adjusted in an amount equal to the time lost as shown on a critical path schedule due to the following:

(i) Changes in the Work ordered by DISTRIBUTION;

(ii) Acts or neglect by DISTRIBUTION’S consultants, acts or neglect of utility districts, acts or neglect of other Contractors performing other Work, provided Contractor has fully and completely performed its responsibilities under the Contract Documents, including but not limited to, its cooperation and coordination responsibilities required by the Contract Documents;

Fires, floods, abnormal weather conditions, earthquakes, civil disturbances, or acts of God, provided damage resulting from same is not the result of Contractor's failure to properly protect the Work as required by the Contract Documents. Notwithstanding the foregoing, the contract times shall not be extended unless Contractor has actually been prevented from completing any part of the Work within the contract time due to delay which is (i) beyond the control of Contractor and (ii) due to reasons for which Contractor is not responsible and (iii) a claim for delay is made as provided for herein. Delays attributable to and within the control of a Subcontractor, or its subcontractors, or supplier shall be deemed to be delays within the control of Contractor.

Contractor shall have no right to an adjustment in the time of completion due to weather conditions which are normal for the locality of the site. The time period for completion of the project has been determined with consideration given to the average climatic range prevailing in the locality of the site.

(3) Where Contractor is prevented from completing any part of the Work within the contract due to delay beyond the control of both DISTRIBUTION and Contractor, an extension of contract times in an amount equal to the time loss due to such delay shall be the Contractor's sole and exclusive remedy for such delay. DISTRIBUTION shall not be liable to Contractor, any Subcontractor, any supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of Contractor, or (ii) delays beyond
the control of both parties including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility districts.

(4) Delays due to adverse weather conditions will not be allowed for weather conditions which do not directly impact the performance of the critical path. Whenever the Contractor has undertaken an exterior critical path activity which is directly impacted by adverse weather conditions, the Contractor shall immediately notify the DISTRICT of the potential delay to such activity. The DISTRICT shall inspect the site, meet with the Contractor and confirm that the exterior critical path activity is impacted and grant an extension of the Contract Times sufficient to allow the Contractor to perform the impacted activity.

(5) If delays acceptable for evaluation occur concurrently, the maximum extension of the Contract time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last.

(6) Delay in completion of the Work beyond the expiration of the contract time resulting from causes other than those listed as acceptable for evaluation are considered inexcusable delays and shall not entitle the Contractor to an extension of the contract time or an adjustment of the Contract amount.

If an inexcusable delay occurs concurrently with acceptable delays for evaluation, the maximum extension of the Contract Time shall be the number of days, if any, by which the duration of a delay exceeds the inexcusable delay. The duration of concurrence is non-compensable.

(d) NOTICE OF DELAY

(1) Notice shall constitute application for extension of time only if notice requests extension and sets forth the impact of the delay on the critical path and Contractor's estimate of additional time required together with full recital of causes of unavoidable delays relied upon.

(2) After receipt of a request for a time extension, with verifiable documents and justifications included, DISTRICT will make decision thereon, and will advise Contractor in writing.

(3) No time extensions shall be considered without related documents and justifications necessary for DISTRICT to make determination.

(4) No time extensions shall be granted for delays for which Contractor fails to give timely notice and Contractor hereby waives any and all damages for delay for which timely notice is not given.

(5) Any request for extension of time shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant is entitled as a result of the occurrence of said event. All claims and adjustments in the contract times shall be determined by DISTRICT. No claim for an adjustment in the contract times will be valid and such claim will be waived if not submitted in accordance with the requirements of this paragraph.
(6) The Contractor's failure to perform in accordance with the construction schedule shall not be excused because the Contractor has submitted time extension requests, unless and until such requests are approved by DISTRICT.

(c) NO DAMAGE FOR CONTRACTOR CAUSED DELAY

Contractor shall not be entitled to any compensation, including but not limited to extended field or home office overhead, field supervision, costs of capital, interest, escalation charges, acceleration costs or other impacts for any delays caused in whole or in part by Contractor's failure to perform its obligations under this Contract, or during periods of delay concurrently caused by Contractor and either DISTRICT or others. Contractor may be compensated for delays caused directly and solely by DISTRICT except that Contractor shall not be entitled to damages for delay to the Work caused by the following reasons:

(1) DISTRICT's right to sequence Work in manner which would avoid disruption to the DISTRICT's tenants and their contractors or other prime contractors and their respective subcontractors, exercised as a result of Contractor's failure to perform its cooperation and coordination responsibilities required by this Contract;

(2) DISTRICT's enforcement of government act or regulation, or the provisions of the Contract Documents; and

(3) Extensive requests for clarifications to construction documents or modifications to contract, provided such clarifications or modifications are processed by DISTRICT or its consultants in a reasonable time commensurate with provisions of Contract requirements.

(f) Granting of time extension for any reason shall in no way operate as waiver on part of DISTRICT, of right to collect liquidated damages for other delays or of right to collect other damages or other rights to which DISTRICT is entitled.

ARTICLE 34. MATERIALS AND WORK

(a) Except as otherwise specifically stated in this Agreement, CONTRACTOR shall provide and pay for all materials, supplies, tools, equipment, labor transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete the Project within specified time.

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

(c) Materials shall be furnished in ample quantities and at such times as to insure uninterrupted progress of work and shall be stored properly and protected as required. DISTRICT has no obligation to pay for any prefabricated material stored offsite until delivered and installed to the jobsite and inspected and approved by the inspector of record. DISTRICT may however consider payment on materials that are stored at the jobsite or in a bonded warehouse upon presentation of invoices and any required certifications.
(d) CONTRACTOR shall, after issuance of the Notice to Proceed by DISTRICT, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the work. CONTRACTOR shall, upon demand from the ARCHITECT, furnish to the ARCHITECT documentary evidence showing that orders have been placed.

(e) DISTRICT reserves the right, for any neglect in not complying with the above instructions, to place orders for such materials and/or equipment as it may deem advisable in order that the work may be completed at the date specified in the Agreement, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by the CONTRACTOR.

(f) No materials, supplies, or equipment for work under this Agreement shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by seller or supplier. CONTRACTOR warrants good title to all material, supplies, and equipment installed or incorporated in work and agrees upon completion of all work to deliver premises, together with all improvements and appurtenances constructed or placed thereon by it, to DISTRICT free from any claims, liens, or charges. CONTRACTOR further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any work covered by this Agreement shall have any right to lien upon premises or any improvement or appurtenance thereon, except that CONTRACTOR may install metering devices or other equipment of utility companies or of political subdivisions, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, CONTRACTOR shall advise DISTRICT as to owner thereof.

(g) Nothing contained in this Article 33, however, shall defeat or impair the rights of persons furnishing material or labor under any bond given by CONTRACTOR for their protection or any rights under any law permitting such persons to look to funds due CONTRACTOR in hand of DISTRICT, and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials or labor when no formal contract is entered into for such materials or labor.

(h) The title to new materials and/or equipment and attendant liability for its protection and safety, shall remain in the CONTRACTOR until incorporated in the work and accepted by the DISTRICT; no part of said materials and/or equipment shall be removed from its place of onsite/offsite storage except for immediate installation in the work; and CONTRACTOR shall keep an accurate inventory of all said materials and/or equipment in a manner satisfactory to the DISTRICT or its authorized representative.

**ARTICLE 35. INTEGRATION OF WORK**

(a) CONTRACTOR shall do all cutting, fitting, patching, and preparation of work as required to make its several parts come together properly, and fit it to receive or be received by work of other contractors or existing conditions showing upon, or reasonably implied by, the drawings and specifications, and shall follow all directions given by the Architect.

(b) All costs caused by defective or ill-timed work shall be borne by CONTRACTOR.

(c) CONTRACTOR shall not endanger any work by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor without the written consent of the ARCHITECT.
CONTRACTOR shall be solely responsible for protecting existing work on adjacent properties and shall obtain all required permits for shoring and excavations near property lines.

(d) When modifying existing work or installing new work adjacent to existing work, CONTRACTOR shall match, as closely as conditions of site and materials will allow, the finishes, textures, and colors of the original work, refinishing existing work as required, at no additional cost to DISTRICT.

(e) CONTRACTOR is aware that this Project may be split into several phases. If the Project is split into phases then CONTRACTOR has made allowances for any delays or damages which may arise from coordination with contractors for other phases. If any delays should arise from a contractor working on a different phase, CONTRACTOR's sole remedy for damages, including delay damages, shall be against the contractor who caused such damage and not the DISTRICT. CONTRACTOR shall provide access to contractors for other phases as necessary to prevent delays and damages to contractors working on other phases of construction.

ARTICLE 36. OBTAINING OF PERMITS, LICENSES AND EASEMENTS

(a) Permits, licenses, and certificates necessary for prosecution of work, shall be secured and paid for by CONTRACTOR, unless otherwise specified. All such permits, licenses, and certificates shall be delivered to the ARCHITECT before demand is made for the certificate of final payment. CONTRACTOR shall, and shall require subcontractors to, maintain contractors’ licenses in effect as required by law.

(b) Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by DISTRICT, unless otherwise specified.

(c) Permits and charges for installation, and inspection thereof, of utility services by serving utilities shall be secured and paid for by DISTRICT.

ARTICLE 37. SURVEYS

Surveys to determine location of property lines and corners will be supplied by DISTRICT. Surveys to determine locations of construction, grading, and site work, shall be provided by CONTRACTOR.

ARTICLE 38. EXISTING UTILITY LINES; REMOVAL, RESTORATION

(a) Pursuant to Government Code Section 4215, the DISTRICT assumes the responsibility for removal, relocation, and protection of utilities located on the construction site at the time of commencement of construction under this Agreement with respect to any such utility facilities which are not identified in the plans and specifications. The CONTRACTOR shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of the DISTRICT to provide for removal or relocation of such utility facilities. If the CONTRACTOR, while performing work under this Agreement, discovers utility facilities not identified by the DISTRICT in the plans or specifications, CONTRACTOR shall immediately notify the DISTRICT and the utility in writing. CONTRACTOR shall be compensated according to the provisions governing changes in the work.
(b) This Article 37 shall not be construed to preclude assessment against the CONTRACTOR for any other delays in completion of the work. Nothing in this Article shall be deemed to require the DISTRICT to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the construction site can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the site of the construction.

(c) As part of the work to be performed, CONTRACTOR shall provide the notices and proceed in accordance with Government Code Sections 4216.2, 4216.3 and 4216.4, and pay all fees charged pursuant to Government Code Section 4216, et seq.

**ARTICLE 39. WORK TO COMPLY WITH APPLICABLE LAWS AND REGULATIONS**

(a) CONTRACTOR shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work as indicated and specified.

(b) If CONTRACTOR observes that drawings or specifications are at variance therewith, CONTRACTOR shall promptly notify ARCHITECT in writing and any changes deemed necessary by the ARCHITECT shall be adjusted as provided for changes in work. If CONTRACTOR performs any work which it knew, or through exercise of reasonable care should have known, to be contrary to such laws, ordinances, rules or regulations, and without such notice to ARCHITECT, CONTRACTOR shall bear all costs arising therefrom. Where plans, drawings or specifications state that materials, processes, or procedures must be approved by the Division of State Architect, State Fire Marshall, or other body or agency, CONTRACTOR shall be responsible for satisfying requirements of such bodies or agencies.

**ARTICLE 40. ACCESS TO WORK**

DISTRICT and its representatives shall at all times have access to work wherever it is in preparation or progress. CONTRACTOR shall provide safe and proper facilities for such access so that DISTRICT’s representatives may perform their functions.

**ARTICLE 41. PAYMENTS BY CONTRACTOR**

CONTRACTOR shall pay:

(1) For all transportation and utility services not later than the 20th day of the calendar month following that in which such services are rendered;

(2) For all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at site of Project and balance of cost thereof not later than the 30th day following completion of that part of work in or on which such materials, tools, and equipment are incorporated or used; and
(3) To each of its subcontractors, not later than the 5th day following each payment to CONTRACTOR the respective amounts allowed CONTRACTOR on account of work performed by respective subcontractor to the extent of such subcontractor’s interest therein.

(4) Within seven (7) days from the time that all or any portion of the retentions are received by CONTRACTOR from DISTRICT, to each of its subcontractors from whom retention has been withheld, each subcontractor’s share of the retention received. However, if a retention payment received by CONTRACTOR is specifically designated for a particular subcontractor, payment of the retention shall be made to the designated subcontractor, if the payment is consistent with the terms of the subcontract. CONTRACTOR may withhold from a subcontractor its portion of the retentions if a bona fide dispute exists between the subcontractor and the CONTRACTOR. The amount withheld from the retention shall not exceed one hundred fifty percent (150%) of the estimated value of the disputed amount.

ARTICLE 42. INSPECTOR’S FIELD OFFICE

CONTRACTOR shall provide for the exclusive use of Inspector a temporary field office to be located as directed by Inspector and to be maintained until removal is authorized by DISTRICT. Office shall be of substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. Door shall have a key-type lock or padlock hasp. A table satisfactory for study of plans and two chairs shall be provided by CONTRACTOR. CONTRACTOR shall provide and pay for adequate electric lights, telephone service (not a pay phone), and adequate heat for the field office until authorized removal.

ARTICLE 43. UTILITIES

(a) All utilities, including but not limited to electricity, water, gas, and telephone used on work shall be furnished and paid for by CONTRACTOR. CONTRACTOR shall furnish and install necessary temporary distribution systems, including meters, if necessary, from distribution points to points on site where utility is necessary to carry on the work. When it is necessary to interrupt any existing utility service to make connections, a minimum of forty-eight (48) hours advance notice shall be given to the DISTRICT and ARCHITECT. Interruptions in utility services shall be of the shortest possible duration for the work at hand and shall be approved by the DISTRICT and the ARCHITECT. In the event any utility service is interrupted without the required forty-eight (48) hours notice, then CONTRACTOR shall be liable for all damage suffered by DISTRICT due to the interruption. Upon completion of work, CONTRACTOR shall remove all temporary distribution systems.

(b) CONTRACTOR may, with written permission of DISTRICT, use DISTRICT’s existing utilities by making prearranged payments to DISTRICT for utilities used by CONTRACTOR for the Project.

ARTICLE 44. SANITARY FACILITIES

The CONTRACTOR shall provide sanitary temporary toilet facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The toilet facilities shall be maintained in a sanitary condition at all times and shall be left at the site until removal is directed by the Inspector. Use of toilet facilities in the work under construction shall not be permitted.

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ARTICLE 45. CLEANING UP

(a) CONTRACTOR at all times shall keep work site free from debris such as waste, rubbish, and excess materials and equipment caused by this work. CONTRACTOR shall not leave debris under, in, or about the work site, but shall promptly remove same. In no event shall any trash or rubble be burned or buried on the project site. Daily clean up will be performed both continuously and simultaneously by CONTRACTOR to the satisfaction of the DISTRICT. If trash removal is not removed as required, the DISTRICT may, at its sole discretion and after proper notification to CONTRACTOR, elect to hire necessary labor to remove same. A notice of backcharge is not required for collecting costs associated with the trash removal.

(b) The Owner requires the Contractor to efficiently use resources to the fullest extent possible in the completion of this project. Resource efficient aspects to be considered in completing this Project include use of techniques that minimize waste generation and recycling of waste generated during the demolition and construction processes. Evaluation of efficient use of resources in the Project will be based on the specific Project goal to divert 25% of the construction waste generated by this project from municipal landfills.

(c) Upon completion of work, CONTRACTOR shall clean interior and exterior of building, including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected. Only non-hazardous cleaning materials shall be used. CONTRACTOR shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and remove temporary fencing, barricades, planking, sanitary facilities and similar temporary facilities from site. If CONTRACTOR fails to clean up, the DISTRICT shall do so and the cost thereof shall be charged to the CONTRACTOR and deducted from any progress payment due.

ARTICLE 46. PATENTS, ROYALTIES, AND INDEMNITIES

The CONTRACTOR shall hold and save the DISTRICT and its governing board, officers, agents, and employees harmless from liability of any nature or kind, including cost and expense, for or on account of any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of this Agreement, including its use by the DISTRICT, unless otherwise specifically provided in the Project Documents, and unless such liability arises from the sole negligence, or active negligence, or willful misconduct of the DISTRICT.

ARTICLE 47. GUARANTEE

(a) CONTRACTOR warrants that the work (which includes any equipment furnished by CONTRACTOR as part of the materials) shall: (a) be free from defects in workmanship and material; (b) be free from defects in any design performed by CONTRACTOR; (c) be new, and conform and perform to the requirements stated in the specifications and where detail requirements are not so stated, shall conform to applicable industry standards; and (d) be suitable for the use stated in the specifications.

(b) The warranty period for discovery of defective work shall commence on the date stamped on the Notice of Completion verifying County recordation and continue for the period set forth in the specifications or for one year if not so specified. If, during the warranty period, the work is not available for use due to defective
work, such time of unavailability shall not be counted as part of the warranty period. The warranty period for corrected defective work shall continue for a duration equivalent to the original warranty period.

(c) District shall give CONTRACTOR prompt written notice after discovery of any defective work. CONTRACTOR shall correct any such defective work, as well as any damage to any other part of the work resulting from such defective work, and provide repair, replacement, or reimbursement, at its sole expense, in a manner approved by the DISTRICT and with due diligence and dispatch as required to make the work ready for use by DISTRICT, ordinary wear and tear, unusual abuse or neglect excepted. Such corrections shall include, but not be limited to, any necessary adjustments, modifications, changes of design (unless of DISTRICT’s design), removal, repair, replacement or reinstallation, and shall include all necessary parts, materials, tools, equipment, transportation charges and labor as may be necessary, and cost of removal and replacement of work shall be performed at a time and in such a manner so as to minimize the disruption to DISTRICT’s use of the work.

(d) In the event of failure of CONTRACTOR or Surety to commence and pursue with diligence said repairs or replacements within ten (10) calendar days after being notified in writing, DISTRICT is hereby authorized to proceed to have defects repaired or replaced and made good at expense of CONTRACTOR and Surety who hereby agree to pay costs and charges therefore immediately on demand.

(e) If, in the opinion of the DISTRICT, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the DISTRICT or to prevent interruption of operations of the DISTRICT, the DISTRICT will attempt to give the written notice required by this Article. If the CONTRACTOR or Surety cannot be contacted or neither complies with the DISTRICT’s requirements for correction within a reasonable time as determined by the DISTRICT, the DISTRICT may, notwithstanding the provisions of this Article, proceed to make such correction or provide such attention and the costs of such correction or attention shall be charged against the CONTRACTOR and Surety. Such action by the DISTRICT will not relieve the CONTRACTOR and Surety of the guarantees provided in this Article or elsewhere in the Project Documents.

(f) This Article does not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. CONTRACTOR shall furnish to DISTRICT all appropriate guarantee or warranty certificates upon completion of the Project or upon request by DISTRICT.

(g) All guarantees required under this Article shall be in writing on the Guarantee form included in the Project Documents.

(h) CONTRACTOR shall provide to DISTRICT instruction manuals for all items which require same.

(i) Nothing herein shall limit any other rights or remedies available to DISTRICT.

(j) The DISTRICT may collect its reasonable costs and attorneys' fees in any action to enforce this Article.
ARTICLE 48. DUTY TO PROVIDE FIT WORKERS

(a) CONTRACTOR and subcontractors shall at all times enforce strict discipline and good order among their employees and shall not employ on work any unfit person or anyone not skilled in work assigned to such person. It shall be the responsibility of CONTRACTOR to ensure compliance with this Article.

(b) Any person in the employ of the CONTRACTOR or subcontractors whom DISTRICT or ARCHITECT may deem incompetent, unfit, troublesome or otherwise undesirable shall be excluded from the work site and shall not again be employed on it except with written consent of DISTRICT.

ARTICLE 49. WAGE RATES, TRAVEL AND SUBSISTENCE

(a) Pursuant to the provisions of Article 2 (commencing at Section 1770), Chapter 1, Part 7, Division 2 of the Labor Code, the governing board of DISTRICT has obtained the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification or type of worker needed for this Project from the Director of the Department of Industrial Relations ("Director.") These rates are on file with the Clerk of the DISTRICT’s governing board and copies will be made available to any interested party on request. CONTRACTOR shall post a copy of such wage rates at the work site. Labor Code Section 1773.2. The rates are available on the Internet at www.dir.ca.gov “Statistics & Research.”

(b) Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half times the above specified rate of per diem wages, unless otherwise specified. Holidays shall be defined in the Collective Bargaining Agreement applicable to each particular craft, classification or type of worker employed.

(c) CONTRACTOR shall pay and shall cause to be paid each worker engaged in work on the Project not less than the general prevailing rate of per diem wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the CONTRACTOR or any subcontractor and such workers.

(d) CONTRACTOR shall pay and shall cause to be paid to each worker needed to execute the work on the Project travel and subsistence payments, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed with the Department of Industrial Relations in accordance with Labor Code Section 1773.8.

(e) If during the period this bid is required to remain open, the Director of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which this public work is to be performed, such change shall not alter the wage rates in the Notice Calling for Bids or the contract subsequently awarded.

(f) Pursuant to Labor Code Section 1775, CONTRACTOR shall as a penalty to the DISTRICT, forfeit fifty dollars ($50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rate of per diem wages, determined by the Director, for such craft or classification in which such worker is employed for any public work done under the Agreement by CONTRACTOR or by any subcontractor under it. The
amount of the penalty shall be determined by the Labor Commission and shall be based on consideration of the CONTRACTOR's mistake, inadvertence or neglect in failing to pay the correct prevailing rate of per diem wage, or the previous record of the CONTRACTOR in meeting his or her prevailing rate of per diem wage obligations, or the CONTRACTOR's willful failure to pay the correct prevailing rate of per diem wages. A mistake, inadvertence or neglect in failing to pay the correct prevailing rate of per diem wage is not excusable if the CONTRACTOR had knowledge of his or her obligations under this part. The difference between such prevailing rate of per diem wage and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing rate of per diem wage shall be paid to each worker by the CONTRACTOR.

(g) Any worker employed to perform work on the Project, which work is not covered by any craft or classification listed in the general prevailing rate of per diem wages determined by the Director shall be paid not less than the minimum rate of wages specified therein for the craft or classification which most nearly corresponds to work to be performed by them, and such minimum wage rate shall be retroactive to time of initial employment of such person in such craft or classification.

(h) Pursuant to Labor Code Section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Labor Code Section 1773.8.

(i) CONTRACTOR shall post at appropriate conspicuous points on the site of the Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned.

**ARTICLE 50. HOURS OF WORK**

(a) As provided in Article 3, (commencing at Section 1810), Chapter 1, Part 7, Division 2 of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the CONTRACTOR or by any subcontractor on any subcontract under this Agreement upon the work or upon any part of the work contemplated by this Agreement shall be limited and restricted by the Agreement to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinafter set forth, work performed by employees of CONTRACTOR in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

(b) The CONTRACTOR shall keep and shall cause each subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by CONTRACTOR in connection with the work or any part of the work contemplated by this Agreement. The record shall be kept open at all reasonable hours to the inspection of the DISTRICT and to the Division of Labor Standards Enforcement, Department of Industrial Relations.

(c) Pursuant to Labor Code Section 1813, the CONTRACTOR shall pay to the DISTRICT a penalty of Twenty-Five Dollars ($25) for each worker employed in the execution of this Contract by the CONTRACTOR or by any subcontractor for each calendar day during which such worker is required or permitted to work more
than eight (8) hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Article 3 (commencing at Section 1810), Chapter 1, Part 7, Division 2 of the Labor Code.

(d) Any work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to DISTRICT.

ARTICLE 51. PAYROLL RECORDS

(a) Pursuant to the provisions of Labor Code Section 1776, the CONTRACTOR shall keep and shall cause each subcontractor performing any portion of the work under this Agreement to 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, worker, or other employee employed by CONTRACTOR in connection with the work.

(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the CONTRACTOR on the following basis:

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

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the DISTRICT, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection upon request by the public or copies thereof made; provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the CONTRACTOR, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the CONTRACTOR.

(4) The form of certification shall be as follows:

I, ________________ (Name-print), the undersigned, am ________________ (position in business) with the authority to act for and on behalf of

________________________ (Name of business and/or CONTRACTOR),
certify under penalty of perjury that the records or copies thereof submitted and consisting of
(description, number of pages) are the originals or true, full and correct copies of the originals which depict the payroll record(s) of the actual disbursements by way of cash, check, or whatever form to the individual or individuals named.

Dated: ______ Signature: ____________________________________________

(c) Contractor shall file a certified copy of the payroll records enumerated in subdivision (a) with the entity that requested the records within ten (10) days after receipt of a written request. In the event that the CONTRACTOR fails to comply within the 10-day period, the CONTRACTOR shall, as a penalty to the DISTRICT, forfeit Twenty-Five Dollars ($25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

(d) Any copy of payroll records made available for inspection as copies and furnished upon request to the public by the DISTRICT, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the CONTRACTOR shall not be marked or obliterated.

(e) The CONTRACTOR shall inform the DISTRICT of the location of the payroll records enumerated under subdivision (a), including the street address, city and county, and shall, within five (5) working days, provide a written notice of a change of location and address.

(f) It shall be the responsibility of the CONTRACTOR to ensure compliance with the provisions of this Article 50 and the provisions of Labor Code Section 1776.

ARTICLE 52. APPRENTICES

(a) The CONTRACTOR acknowledges and agrees that, if this Agreement involves a dollar amount greater than or a number of working days greater than that specified in Labor Code Section 1777.5, this Agreement is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of the CONTRACTOR to ensure compliance with this Article 51 and with Labor Code Section 1777.5 for all apprenticing occupations.

(b) Apprentices of any crafts or trades may be employed and, when required by Labor Code Section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

(c) Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work of the craft or trade to which he or she is registered.
(d) Only apprentices, as defined in Section 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4 (commencing at Section 3070), Division 3 of the Labor Code, are eligible to be employed on public works. The employment and training of each apprenticeship shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he or she is training.

(e) Pursuant to Labor Code Section 1777.5, the CONTRACTOR and any subcontractors employing workers in any apprenticeship craft or trade in performing any work under this Agreement shall employ apprentices in at least the ratio set forth in Section 1777.5 and apply to the applicable joint apprenticeship committee for a certificate approving the CONTRACTOR or subcontractor under the applicable apprenticeship standards for the employment and training of apprentices.

(f) Every contractor and subcontractor shall submit contract award information to the applicable joint apprenticeship committee which shall include an estimate of journeyman hours to be performed under the Agreement, the number of apprentices to be employed and the approximate dates the apprentices will be employed.

(g) If the CONTRACTOR or subcontractor willfully fails to comply with Labor Code Section 1777.5, then, upon a determination of noncompliance by the Chief of the Division of Apprenticeship Standards, the CONTRACTOR or subcontractor shall be subject to the penalties imposed under Labor Code Section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council.

(h) The CONTRACTOR and all subcontractors shall comply with Labor Code Section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

(i) CONTRACTOR shall become fully acquainted with the law regarding apprentices prior to commencement of the work. Special attention is directed to Sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and Title 8, California Code of Regulations, Section 200, et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, 8th Floor, San Francisco, California 94102, (415) 703-4920.

ARTICLE 53. LABOR - FIRST AID

The CONTRACTOR shall maintain emergency first aid treatment for CONTRACTOR's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C.A., Sec. 651, et seq.).

ARTICLE 54. PROTECTION OF PERSONS AND PROPERTY

(a) The CONTRACTOR shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Agreement and shall take all necessary measures and be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance by the DISTRICT. CONTRACTOR shall provide such heat, covering, and enclosures as are necessary to protect all work, materials, equipment, appliances, and tools against damage.
by weather conditions. All work shall be solely at the CONTRACTOR's risk with the exception of damage to
the work caused by "acts of God" as defined in Public Contract Code Section 7105.

(b) CONTRACTOR shall take, and require subcontractors to take, all necessary precautions for safety of
workers and shall comply with all applicable federal, state, local and other safety laws, standards, orders, rules,
regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to the work site
and to provide a safe and healthful place of employment. CONTRACTOR shall furnish, erect and properly
maintain at all times, as directed by DISTRICT or ARCHITECT or required by conditions and progress of
work, all necessary safety devices, safeguards, construction canopies, signs audible devices for protection of the
blind, safety rails, belts and nets, barriers, lights, and watchmen for protection of workers and the public and
shall post danger signs warning against hazards created by such features in the course of construction.
CONTRACTOR shall designate a responsible employee, whose duty shall be to post information regarding
protection and obligations of workers and other notices required under occupational safety and health laws, to
comply with reporting and other occupational safety requirements, and to protect the life, safety and health of
workers. Name and position of person so designated shall be reported in writing to DISTRICT by
CONTRACTOR. CONTRACTOR shall correct any violations of safety laws, standards, orders, rules, or
regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and
Health, such violation shall be corrected immediately by the CONTRACTOR at CONTRACTOR's expense.

(c) In an emergency affecting safety of person or of work or of adjoining property, CONTRACTOR,
without special instruction or authorization from ARCHITECT or DISTRICT, is hereby permitted to act, at its
discretion, to prevent such threatened loss or injury; and CONTRACTOR shall so act if so authorized or
instructed by Architect or DISTRICT. Any compensation claimed by CONTRACTOR on account of
emergency work shall be determined by written agreement with the DISTRICT.

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

(e) CONTRACTOR shall (unless waived by the DISTRICT in writing):

(1) When performing new construction on existing sites, become informed and take into specific
account the maturity of the students on the site; perform work which may interfere with school routine
before or after school hours; enclose working area with a substantial barricade; not allow any
unauthorized individuals on the site; require all workers on the Project to be conspicuously identified
either by a firm logo on their clothing or prominent identification badge and arrange work to cause a
minimum amount of inconvenience and danger to students and faculty in their regular school
activities.

(2) Provide substantial barricades around any shrubs or trees indicated to be preserved.

(3) Deliver materials to building area over route designated by ARCHITECT.
(4) When directed by DISTRICT, take preventive measures to eliminate objectionable dust.

(5) Enforce all instructions of DISTRICT and ARCHITECT regarding signs, advertising, fires, and smoking and require that all workers comply with all regulations while on construction site.

(6) Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved civil engineer at no cost to the DISTRICT.

(7) CONTRACTOR must confine all construction activity within the identified project parameters. Any work that must take place outside construction parameters must be approved by the DISTRICT in writing 48 hours in advance of work proceeding.

(8) CONTRACTOR parking must be as approved by the DISTRICT only.

**ARTICLE 55. NON-DISCRIMINATION**

In the performance of the terms of this Agreement, CONTRACTOR agrees that it will not engage in nor permit such subcontractor as it may employ to engage in unlawful discrimination in employment of persons because of the race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, age or sex of such persons.

**ARTICLE 56. SCHEDULE OF VALUES AND PERIODICAL ESTIMATES**

(a) CONTRACTOR shall furnish on form(s) approved by DISTRICT:

(1) Within ten (10) calendar days of award of contract a detailed schedule of values giving complete breakdown of contract price for each component of the Project or site which shall include all subcontractor/supplier agreements showing dollar amounts of these agreements to justify the schedule of values; and

(2) A periodical itemized estimate of work done for purpose of making partial payments thereon. Change order work shall be clearly identified on a separate schedule of values.

(3) Within ten (10) calendar days of request of DISTRICT, a schedule of estimated monthly payments which shall be due CONTRACTOR under the Agreement.

(b) Values employed in making up any of these schedules are subject to the ARCHITECT’s written approval and will be used only for determining basis of partial payments and will not be considered as fixing a basis for additions to or deductions from contract price.
ARTICLE 57. CONTRACTOR CLAIMS

If the CONTRACTOR shall claim compensation for any damage sustained by reason of the acts of the DISTRICT or its agents, CONTRACTOR shall, within five (5) calendar days after sustaining of such damage, make to the ARCHITECT a written statement of the damage sustained. On or before the 15th day of the month succeeding that in which such damage shall have been sustained the CONTRACTOR shall file with the DISTRICT an itemized statement of the details and amount of such damage, and unless such statement shall be made as thus required, CONTRACTOR's claims for compensation shall be forfeited and invalidated and it shall not be entitled to consideration for payment on account of any such damage.

ARTICLE 58. DISPUTES - ARCHITECT’S DECISIONS

(a) The ARCHITECT shall, within a reasonable time, make decisions on all matters relating to the CONTRACTOR’s execution and progress of the work. The decisions of the ARCHITECT shall not be binding, but shall be advisory only on the CONTRACTOR for the purpose of CONTRACTOR’s obligation to proceed with the work.

(b) Except for tort claims, all claims by the CONTRACTOR for a time extension, payment of money or damages arising from work done by, or on behalf of, the CONTRACTOR pursuant to the Agreement and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or as to the amount of payment which is disputed by the DISTRICT of Three Hundred Seventy Five Thousand Dollars ($375,000) or less shall be subject to the settlement procedures set forth in Public Contract Code Section 20104, et seq. which provisions are incorporated herein by reference.

(c) In the event of a dispute between the parties as to performance of the work, the interpretation of this Agreement or payment or nonpayment for work performed or not performed, the parties shall attempt to resolve the dispute. Pending resolution of the dispute, CONTRACTOR agrees to continue the work diligently to completion. If the dispute is not resolved, CONTRACTOR agrees it will neither rescind the Agreement nor stop the progress of the work, but CONTRACTOR’s sole remedy shall be to submit such controversy to determination by a court of the State of California, in Orange County, having competent jurisdiction of the dispute, after the Project has been completed, and not before.

ARTICLE 59. PAYMENTS

(a) Unless otherwise specified in writing, each month within thirty (30) days after receipt by the DISTRICT of the monthly progress schedule and an undisputed, properly submitted payment request from CONTRACTOR which has been certified for payment by the Architect, there shall be paid to CONTRACTOR a sum equal to ninety percent (90%) of value of work performed and of materials delivered to the jobsite and inspected and approved by the inspector of record and subject to or under the control of the DISTRICT and unused up to the last day of the previous month, less aggregate previous payments. Public Contract Code Section 20104.50

(b) Monthly payments shall be made only on the basis of monthly estimates which shall be prepared by CONTRACTOR on a form approved by DISTRICT and filed on the twentieth (20th) day of the month preceding that month within which payment is to be made. Work completed as estimated shall be an estimate only and no
inaccuracy or error in said estimate shall operate to release CONTRACTOR or Surety from any damages arising from such work or from enforcing each and every provision of this Agreement, and DISTRICT shall have the right subsequently to correct any error made in any estimate for payment. DISTRICT shall review draft pay applications and notify CONTRACTOR of status by the twenty-fifth (25th) of the month preceding that month within which payment is to be made. CONTRACTOR shall not be entitled to have any payment estimates processed or be entitled to have any payment of work performed so long as any lawful or proper direction concerning work, or any portion thereof, given by the DISTRICT shall remain un-complied with by the CONTRACTOR. CONTRACTOR agrees to ten percent (10%) retention on all progress payments. Public Contract Code Section 9203.

(c) DISTRICT has discretion to require from the CONTRACTOR any of the following information with the application for payment: (i) certified payroll covering the period of the prior application for payment; (ii) unconditional waivers and releases from all subcontractors/suppliers for which payment was requested under the prior application for payment; and/or (iii) receipts or bills of sale for any items. CONTRACTOR agrees that payment may be contingent upon District receiving any one or more of these documents.

(d) Before payment is made hereunder, a certificate in writing shall be obtained from the ARCHITECT stating that the work for which the payment is demanded has been performed in accordance with the terms of the Project Documents and that the amount stated in the certificate is due under the terms of the Project Documents, which certificate shall be attached to and made a part of the claim made and filed with the DISTRICT, provided that if the ARCHITECT shall, within three (3) days after written demand therefore, fail to deliver such certificate to the DISTRICT, the CONTRACTOR may file its claim with the DISTRICT without said certificate, but together with such claim shall be filed a statement that demand was made for such certificate and that the same was refused. Thereupon, the DISTRICT will either allow said claim as presented or shall, by an order entered on the minutes of said DISTRICT state the reasons for refusing to allow said claim. It is understood, moreover, that the certificate of the ARCHITECT shall not be conclusive upon the DISTRICT, but advisory only.

(e) Four original signed, notarized copies of pay application shall be submitted to the DISTRICT by the last day of the month. Upon receipt of CONTRACTOR’s payment request, DISTRICT shall review the payment request as soon as practicable after receipt for the purpose of determining that the payment request is proper. Any payment request determined not to be proper shall be returned to the CONTRACTOR as soon as practicable but not later than seven (7) days after receipt and shall be accompanied by a document setting forth in writing the reasons(s) why the payment request was not proper. Public Contract Code Section 20104.50

(f) No payment by DISTRICT hereunder shall be interpreted so as to imply that DISTRICT has inspected, approved or accepted any part of the work.

(g) Unless otherwise provided, on or before making request for final payment of the undisputed amount due under the Agreement, CONTRACTOR shall submit to DISTRICT, in writing a summary of all claims for compensation under or arising out of this Agreement which were timely filed. The acceptance by CONTRACTOR of the payment of the final amount shall constitute a waiver of all claims against DISTRICT under or arising out of this Agreement, except those previously made, in a timely manner and in writing, and identified by CONTRACTOR as unsettled at the time of CONTRACTOR's final request for payment.
(h) CONTRACTOR shall pay each of its subcontractors from whom retention has been withheld each subcontractor’s share of the retention received within seven (7) days from the time that all or any portion of the retention are received by the CONTRACTOR subject to any limitations set forth in Public Contract Code Section 7107(e).

(i) The final payment of the ten percent (10%) retention of the value of the work done under this Agreement, if unencumbered, shall be made thirty-five (35) days after recording by the DISTRICT of the Notice of Completion at the County Recorder’s Office. Approval of completion of the project will be made only by action of the governing board of the DISTRICT. Public Contract Code Section 7107.

ARTICLE 60. CHANGES AND EXTRA WORK

(a) DISTRICT may, as provided by law and without affecting the validity of this Agreement, order changes, modifications, deletions and extra work by issuance of written change orders from time to time during the progress of the Project, contract sum being adjusted accordingly. All such work shall be executed under conditions of the original Agreement except that any extension of time caused thereby shall be adjusted at time of ordering such change. DISTRICT has discretion to order changes on a “time and material” basis with adjustments to time made after CONTRACTOR has justified through documentation the impact on the critical path of the Project.

(b) Notwithstanding any other provision in the Project Documents, the adjustment in the contract sum, if any, and the adjustment in the contract time, if any, set out in a change order shall constitute the entire compensation and/or adjustment in the contract time due CONTRACTOR arising out of the change in the work covered by the change order unless otherwise provided in the change order. The amount of the compensation due CONTRACTOR shall be calculated pursuant to subparagraph (e) of this Article 59. The entire compensation shall not include any additional charges not set forth in subparagraph (e) and shall not include delay damages (due to processing of a change order, refusal to sign a change order) indirect, consequential, and incidental costs including any project management costs, extended home office and field office overhead, administrative costs and profit other than those amounts authorized under subparagraph (e) of this Article 59.

(c) In giving instructions, ARCHITECT shall have authority to make minor changes in work, not involving change in cost, and not inconsistent with purposes of the Project. Otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order from DISTRICT, authorized by action of the governing board, and no claim for addition to contract sum shall be valid unless so ordered.

(d) If the ARCHITECT determines that work required to be done constitutes extra work outside the scope of the Agreement, the ARCHITECT shall send a request for a detailed proposal to the CONTRACTOR. CONTRACTOR will respond with a detailed proposal within five (5) calendar days of receipt of the Request for Proposal which shall include a complete itemized cost breakdown of all labor and materials showing actual quantities, hours, unit prices, and the wage rates required for the change. If the change order involves a change in construction time, a request for the time change shall accompany the change order cost breakdown. All such requests for time shall be specified by CONTRACTOR as either “work days” or “calendar days.” Any request for time received with only the designation of “days” shall be considered calendar days. The term “work days” as used in this paragraph shall mean Monday through Friday, excluding Saturdays, Sundays and federal/State of California observed holidays. If the work is to be performed by a subcontractor, CONTRACTOR must include
a bid from the subcontractor containing the same detailed information as required for CONTRACTOR. No extensions of time will be granted for change orders that, in the opinion of the ARCHITECT, do not affect the critical path of the Project.

(c) Value of any such extra work, change, or deduction shall be determined at the discretion of DISTRICT in one or more of the following ways:

(1) By mutual written acceptance of a lump sum proposal from CONTRACTOR properly itemized and supported by sufficient substantiating data to permit evaluation by DISTRICT and ARCHITECT.

(2) By unit prices contained in CONTRACTOR's original bid and incorporated in the Project Documents or fixed by subsequent agreement between DISTRICT and CONTRACTOR.

(3) By cost of material and labor and percentage for overhead and profit (“time and material”). If the value is determined by this method the following requirements shall apply:

(A) Daily Reports by Contractor.

(i) General. At the close of each working day, the CONTRACTOR shall submit a daily report to the ARCHITECT and the Inspector, on forms approved by the DISTRICT, together with applicable delivery tickets, listing all labor, materials, and equipment involved for that day, and for other services and expenditures when authorized concerning extra work items. An attempt shall be made to reconcile the report daily, and it shall be signed by the ARCHITECT and the CONTRACTOR. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by Subcontractors or others shall be submitted through the CONTRACTOR.

(ii) Labor. The report shall show names of workers, classifications, and hours worked and hourly rate. Project Superintendent expenses are not allowed.

(iii) Materials. The report shall describe and list quantities of materials used and unit cost.

(iv) Equipment. The report shall show type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable, and hourly/daily cost.

(v) Other Services and Expenditures. Other services and expenditures shall be described in such detail as the DISTRICT may require.

(B) Basis for Establishing Costs
(i) Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft classification or type of workers at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from federal, state or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. The use of labor classification which would increase the extra work cost will not be permitted unless the CONTRACTOR establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

(ii) Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the work site in the quantities involved, plus sales tax, freight and delivery. The DISTRICT reserves the right to approve materials and sources of supply, or to supply materials to the CONTRACTOR if necessary for the progress of the work. No markup shall be applied to any material provided by the DISTRICT.

(iii) Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of $100 or less or where an invoice is not provided.

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental source, or distributors, at the time the work is performed. The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Necessary loading and transportation costs for equipment used on the extra work shall be included.

If equipment is used intermittently and, when not in use, could be returned to its rental source at less expense to the DISTRICT than holding it at the work site, it shall be returned, unless the CONTRACTOR elects to keep it at the work site at no expense to the DISTRICT.

All equipment shall be acceptable to the ARCHITECT, in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and manufacturer's approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

(iv) Other Items. The DISTRICT may authorize other items which may be required on the extra work. Such items include labor, services, material and equipment which are different in their nature from those required by the work and which are of a type not ordinarily available from the CONTRACTOR or any of the subcontractors. Invoices covering all such items in detail shall be submitted with the request for payment.

(v) Invoices. Vendors' invoices for material, equipment rental, and other expenditures, shall be submitted with the request for payment. If the request for payment is not
substantiated by invoices or other documentation, the DISTRICT may establish the cost of the item involved at the lowest price which was current at the time of the report.

(C) The following form shall be used as applicable by the DISTRICT and CONTRACTOR to communicate proposed additions and deductions to the Agreement.

### EXTRA CREDIT

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Material/Equipment (attach itemized quantity and unit cost plus sales tax)</td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>Labor (attach itemized hours and rates)</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>iv.</td>
<td>If subcontractor performed work, add Subcontractor's overhead and profit to portions performed by it, not to exceed 15% of Item iii. above</td>
<td></td>
</tr>
<tr>
<td>v.</td>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>vi.</td>
<td>General Contractor's Overhead and Profit, not to exceed 15% of Item v if Contractor performed the work. If subcontractor performed the work, not to exceed 5% of Item v. Of portions performed by Contractor and subcontractors, portions performed by Contractor shall not exceed 15% of Item V, and portions performed by Subcontractor shall not exceed 5% of Item v.</td>
<td></td>
</tr>
<tr>
<td>vii.</td>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>viii.</td>
<td>Bond and Liability Insurance Premium, if in fact additional bonds or insurance were actually purchased, not to exceed 1% of Item vii.</td>
<td></td>
</tr>
<tr>
<td>ix.</td>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

(4) It is expressly understood that the value of such extra work or changes, as determined by any of the aforementioned methods, expressly includes any and all of the CONTRACTOR's costs and expenses, both direct and indirect, resulting from additional time required on the project, or resulting...
from delays to the Project. Any costs or expenses not included are deemed waived. For purposes of determining the cost, if any, of any extra work, change, addition or omission hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to CONTRACTOR, and CONTRACTOR shall ensure that such discounts, rebates, refunds and returns may be secured, and the amount thereof shall be allowed as a reduction of CONTRACTOR’S cost in determining the actual cost of construction for purposes of any extra work, change addition or omission in the work as provided herein.

(f) If the CONTRACTOR should claim that any instruction, request, drawing, specification, action, condition, omission, default, or other situation obligates the DISTRICT to pay additional compensation to CONTRACTOR or to grant an extension of time, or constitutes a waiver of any provision in the Agreement, CONTRACTOR shall notify the DISTRICT, in writing, of such claim within five (5) calendar days from the date CONTRACTOR has actual or constructive notice of the factual basis supporting the claim. The notice shall state the factual bases for the claim and cite in detail the Project Documents (including plans and specifications) upon which the claim is based. The CONTRACTOR's failure to notify the DISTRICT within such five (5) day period shall be deemed a waiver and relinquishment of such a claim. If such notice be given within the specified time, the procedure for its consideration shall be as stated above in these General Conditions.

(g) “PROHIBITED USAGE OF CONTRACTOR QUALIFYING LANGUAGE STAMPS ON DISTRICT DRAWINGS OR CONTRACT FORMS.” Contractor shall not countersign or endorse any form, drawing, change order, contract or other documents with any conditions not mutually agreed to in advance by the DISTRICT and the CONTRACTOR. Endorsement of a contract, change order, specification, drawing or form with the following: “This change order is being executed without waiver of the right to seek additional compensation for such services,” shall be of no legal force or effect.

ARTICLE 61. COMPLETION

(a) The DISTRICT shall accept completion of the Project and have the Notice of Completion recorded within ten (10) days of acceptance of completion of the Project when the entire work including punch list items shall have been completed to the satisfaction of the DISTRICT. Civil Code Section 3093. The work may only be accepted as complete by action of the DISTRICT’s Governing Board.

(b) However, the DISTRICT, at its sole option, may accept completion of the Project and have the Notice of Completion recorded when the entire work including individual portions of the work shall have been completed to the satisfaction of the DISTRICT, except for minor corrective items, as distinguished from incomplete items.

(c) A final walk through of the Project to determine completion and to record the Notice of Completion shall occur only upon a valid claim by CONTRACTOR that the Project is complete except for minor corrective items. Any erroneous claims of completion by CONTRACTOR resulting in a premature walk through shall be at CONTRACTOR’s sole cost and expense and DISTRICT shall make adjustments to the contract price by reducing the amount thereof to pay for any costs incurred by the DISTRICT due to the erroneous claims by the CONTRACTOR that the Project is complete. Minor corrective items shall be identified in the final walk through of the Project.
(d) If the CONTRACTOR fails to complete the minor corrective items prior to the expiration of the thirty-five (35) day period immediately following recording of the Notice of Completion, the DISTRICT shall withhold from the final payment an amount equal to one hundred fifty percent (150%), as determined by the DISTRICT, of the amount of each item until such time as the item is completed. Public Contract Code Section 7107. At the end of such 35-day period, if there are items remaining to be corrected, the DISTRICT may elect to proceed as provided in Article 61(b) entitled "Adjustments to Contract Price."

ARTICLE 62. ADJUSTMENTS TO CONTRACT PRICE

(a) If CONTRACTOR defaults or neglects to carry out the work in accordance with the Project Documents or fails to perform any provision thereof, DISTRICT may, after ten (10) days written notice to the CONTRACTOR and without prejudice to any other remedy it may have, make good such deficiencies.

(b) The DISTRICT shall adjust the total contract price by reducing the amount thereof by the cost of making good such deficiencies. If DISTRICT deems it inexpedient to correct work not done in accordance with the Project Documents, an equitable reduction in the contract price shall be made therefore.

ARTICLE 63. CORRECTION OF WORK

(a) CONTRACTOR shall promptly remove all work identified by DISTRICT as failing to conform to the Project Documents, whether incorporated or not. CONTRACTOR shall promptly replace and re-execute its own work to comply with Project Documents without additional expense to DISTRICT and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

(b) If CONTRACTOR does not remove such work within a reasonable time, fixed by written notice, DISTRICT may remove it and may store the material at CONTRACTOR's expense. If CONTRACTOR does not pay expenses of such removal within ten (10) days' time thereafter, DISTRICT may, upon ten (10) days written notice, sell such materials at auction or at private sale and shall account for net proceeds thereof, after deducting all costs and expenses that should have been borne by CONTRACTOR.

ARTICLE 64. EXTENSION OF TIME - LIQUIDATED DAMAGES

(a) The CONTRACTOR and DISTRICT hereby agree that the exact amount of damages for failure to complete the work within the time specified is extremely difficult or impossible to determine. CONTRACTOR shall be assessed liquidated damages for each and every day the work required under the Project Documents remains unfinished past the time for completion, as set forth in the Agreement, and any extensions of time granted by the DISTRICT to the CONTRACTOR under the terms of the Project Documents. The CONTRACTOR will pay to the DISTRICT or DISTRICT may retain from amounts otherwise payable to the CONTRACTOR, said amount for each day after failure to meet the requirements of the contract completion as scheduled in the Agreement. Government Code Section 53069.85 For purposes of this article, the work shall be considered "complete" in accordance with the provisions of Article 60, "COMPLETION", except that the work may be considered complete without formal acceptance by the DISTRICT Governing Board so long as the Governing Board, at its next regularly scheduled meeting, accepts the work.
(b) CONTRACTOR shall not be charged for liquidated damages, as set forth above, because of any delays in completion of work which are not the fault or negligence of CONTRACTOR, including but not restricted to acts of God. CONTRACTOR shall within ten (10) days of beginning of any such delay, notify DISTRICT in writing of causes of delay. CONTRACTOR shall provide documentation and justification to substantiate the delay and its relation to the Project's critical path. DISTRICT shall ascertain the facts and extent of delay and grant extension of time for completing work when, in its judgment, the findings of fact justify such an extension. The DISTRICT's finding of fact thereon shall be final and conclusive on the parties hereto. Extension of time shall apply only to that portion of work affected by the delay, and shall not apply to other portions of work not so affected.

**ARTICLE 65. PAYMENTS WITHHeld**

(a) In addition to amount which DISTRICT may retain under Article entitled "COMPLETION" and Article entitled "PAYMENTS," DISTRICT may withhold a sufficient amount or amounts of any payment or payments otherwise due to CONTRACTOR, as in its judgment may be necessary to cover:

1. Payments which may be past due and payable for just claims against CONTRACTOR or any subcontractors, or against and about the performance of work on the Project, including, without limitation, payments made pursuant to the Article entitled "PAYMENTS BY CONTRACTOR."

2. The cost of defective work which CONTRACTOR has not remedied.

3. Liquidated damages assessed against CONTRACTOR.

4. Penalties for violation of labor laws.

5. The cost of materials ordered by the DISTRICT pursuant to Article 33 entitled "MATERIALS AND WORK."

6. The cost of completion of this Agreement if there exists a reasonable doubt that this Agreement can be completed for the balance then unpaid to CONTRACTOR.

7. Damage to DISTRICT, another contractor, or subcontractor.

8. Site clean-up as provided in Article 44 entitled "CLEANING UP."

9. Payments to indemnify, defend, or hold harmless the DISTRICT.

10. Any payments due to the District including but not limited to payments for failed tests, utilities or imperfections.

11. Extra services for ARCHITECT.
(12) Extra services for the INSPECTOR including but not limited to reinspection required due to CONTRACTOR’s failed tests or installation of unapproved or defective materials and CONTRACTOR’s requests for inspection and CONTRACTOR’s failure to attend the inspection.

(13) Failure of CONTRACTOR to submit on a timely basis, proper and sufficient documentation required by the Project Documents, including without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders and verified reports.

(14) Any other obligation(s) of the DISTRICT which the DISTRICT is authorized and/or compelled by law to perform.

(b) If the above grounds are in the opinion of the DISTRICT removed by or at the expense of CONTRACTOR, payment shall be made for amounts withheld because of them.

(c) DISTRICT may apply such withheld amount or amounts to payment of such claims or obligations at its discretion. In so doing, DISTRICT shall make such payments on behalf of CONTRACTOR. If any payment is so made by DISTRICT, then such amount shall be considered as a payment made under contract by DISTRICT to CONTRACTOR and DISTRICT shall not be liable to CONTRACTOR for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligations. DISTRICT will render CONTRACTOR an accounting of such funds disbursed on behalf of CONTRACTOR.

(d) As an alternative to payment of such claims or obligations, DISTRICT, in its sole discretion, may reduce the total contract price as provided in Article 61 entitled "ADJUSTMENTS TO CONTRACT PRICE."

ARTICLE 66. TAXES

(a) CONTRACTOR will pay all applicable federal, state and local taxes on all materials, labor, or services furnished by it, and all taxes arising out of its operations under the Project Documents.

(b) If under federal excise tax law any transaction hereunder constitutes a sale on which a federal excise tax is imposed and the sale is exempt from such excise tax because it is a sale to a state or local government for its exclusive use, the DISTRICT, upon request, will execute documents necessary to show (1) that the DISTRICT is a political subdivision of the State for the purposes of such exemption and (2) that the sale is for the exclusive use of the DISTRICT. No excise tax for such materials shall be included in any bid price.

ARTICLE 67. NO ASSIGNMENT

The CONTRACTOR shall not assign, transfer, convey, sublet or otherwise dispose of this Agreement or of its rights, title or interest in or to the same or any part thereof. If the CONTRACTOR shall assign, transfer, convey, sublet or otherwise dispose of the Agreement or its right, title or interest therein, or any part thereof, such attempted or purported assignment, transfer, conveyance, sublease or other disposition shall be null, void and of no legal effect whatsoever; and the Agreement may, at the option of the DISTRICT, be terminated.
revoked and annulled, and the DISTRICT shall thereupon be relieved and discharged from any and all liability
and obligations growing out of the same to the CONTRACTOR, and to its purported assignee or transferee.

ARTICLE 68. NOTICE

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

(1) If notice is given to DISTRICT, by personal delivery thereof to DISTRICT, or by depositing
same in United States mail, enclosed in a sealed envelope addressed to DISTRICT, and sent by
registered or certified mail with postage prepaid;

(2) If notice is given to CONTRACTOR, by personal delivery thereof to said CONTRACTOR,
or to CONTRACTOR's superintendent at site of Project, or by depositing same in United States mail,
enclosed in a sealed envelope addressed to said CONTRACTOR at its regular place of business or at
such address as may have been established for the conduct of work under this Agreement, and sent by
registered or certified mail with postage prepaid;

(3) If notice is given to surety or other persons, by personal delivery to such surety or other
person, or by depositing same in United States mail, enclosed in a sealed envelope, addressed to such
surety or person at the address of such surety or person last communicated by surety or other person to
to party giving notice, and sent by registered or certified mail with postage prepaid.

ARTICLE 69. NO WAIVER

The failure of the DISTRICT in any one or more instances to insist upon strict performance of any of the terms
of this Agreement or to exercise any option herein conferred shall not be construed as a waiver or
relinquishment to any extent of the right to assert or rely upon any such terms or option on any future occasion.

ARTICLE 70. NON-UTILIZATION OF ASBESTOS MATERIAL

(a) The CONTRACTOR will be required to execute and submit the Certificate Regarding Non-Asbestos
Containing Materials.

(b) Should asbestos containing materials be installed by the CONTRACTOR in violation of this
certification, or if removal of asbestos containing materials is part of the Project, decontaminations and
removals will meet the following criteria:

(1) Decontamination and removal of work found to contain asbestos or work installed with
asbestos containing equipment shall be done only under the supervision of a qualified consultant,
knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection
Agency (EPA).
(2) The asbestos removal contractor shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the asbestos consultant who shall have sole discretion and final determination in this matter.

(3) The asbestos consultant shall be chosen and approved by the DISTRICT who shall have sole discretion and final determination in this matter.

(4) The work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

(c) Cost of all asbestos removal, including, but not necessarily limited to the cost of the asbestos removal contractor, the cost of the asbestos consultant, analytical and laboratory fees, time delays and additional costs as may be incurred by the DISTRICT shall be borne entirely by the CONTRACTOR.

(d) Hold Harmless: Interface of work for the Project with work containing asbestos shall be executed by the CONTRACTOR at his/her risk and at his/her discretion with full knowledge of the currently accepted standards, hazards, risks and liabilities associated with asbestos work and asbestos containing products. By execution of the Agreement, the CONTRACTOR acknowledges the above and agrees to hold harmless the DISTRICT, its Governing Board, employees, agents, and ARCHITECT and assigns for all asbestos liability which may be associated with this work. The CONTRACTOR further agrees to instruct his/her employees with respect to the above mentioned standards, hazards, risks and liabilities.

ARTICLE 71. LEAD

Pursuant to the Lead-Safe Schools Protection Act (Education Code Sections 32240, et seq.) and other applicable law, the CONTRACTOR shall not use lead-based paint, lead plumbing and solders, or other potential sources of lead contamination in the construction of any new school facility or the modernization or renovation of any existing school facility.

ARTICLE 72. GOVERNING LAW

The laws of the State of California shall govern the Project and the Agreement.
SPECIAL CONDITIONS
SPECIAL CONDITIONS

1. **Application of Special Conditions.** These Special Conditions form a part of the Contract Documents for the Work generally described as:

   **I.T. SERVER ROOM RENOVATION
   AT SADDLEBACK COLLEGE
   BID NO. 1097**

2. Contractor shall indicate the name of their Project Manager and provide a summary of his/her previous experience and phone number to be reached 24-hours a day, seven days a week.

3. Shutdown of any systems must be coordinated and scheduled with Saddleback College Maintenance and Operations staff. Provide 48-hrs. Minimum notice. Any premium paid required to perform system shutdowns shall be included in bid price.

4. Contractor to provide and coordinate all permits, inspections and fees with AQMD as necessary.

5. Contractor is required to recycle all demolished concrete and asphalt removed by this project and to provide the District with manifests indicating recycled quantities. Removal of rebar from demolished concrete as required to recycle shall be included in bid price.

6. Contractor is responsible for the hauling of all debris and disposal at a legal dumpsite.

7. The Contractor is to provide vehicular and pedestrian traffic control as required to facilitate on-campus safety on an as required basis. Roadways are to remain clear and unobstructed during the course of construction. Limited blockage for material delivery will be allowed through coordination with the District’s representative.

8. Standard working hours are from 7:00am to 3:30pm. Alternate shifts and weekend work may be approved upon request. The Contractor is to provide 48 hours notice prior to the date extended hours are to be provided. All overtime or extended hours inspection charges will be paid by the Contractor.

9. Construction parking is to be contained within the designated construction parking area (to be determined at the kick-off-meeting). Temporary parking permits up to (25) will be issued at no cost to the Contractor for the duration of the project.

10. Construction materials are to be located within the designated staging area (to be determined at the kick-off meeting) per District direction. Contractor to install and maintain temporary fencing.

11. Contractor to maintain appropriate building access and exiting points of all existing buildings in the work area during all phases of the construction work.

12. Contractor is to provide temporary sanitary conveniences for the use of employees and persons engaged in the construction work, including subcontractors and their employees, as required by law, ordinances, or regulations of public authorities having jurisdiction.

13. Any damage to existing facilities is to be repaired to the condition it was at the beginning of construction. The Contractor will be required to repair interior and exterior surfaces and finishes, utility systems, asphalt in the parking lot, curbs, driveways, signage, turf and irrigation around the construction area, etc., that is damaged as a result of construction.

14. The Contractor may use electrical utilities within the construction site. Power will be provided by the Owner.
15. The Contractor is to allow the Owner, faculty, students, staff, and other related persons including furniture & equipment movers, maintenance and operations personnel, etc., access to all existing buildings surrounding the construction site during construction.

16. The Contractor shall provide and maintain administrative field office facilities within the staging area. This shall include an office space for the Inspector of Record for the project.

17. The Contractor is to mobilize within 5 days of receipt of the Notice to Proceed. The Contractor is to initiate field investigation and preparation of shop drawings and submittals so as to submit these for review and approval by the Architect within the first 15 days of the project.

18. (ALLOWANCE) Due to the nature of this project, unforeseen conditions may be encountered during construction. An allowance in the amount indicated in the Bid Documents is to be included as part of the base bid and will be used for unforeseen conditions. Use of this allowance will require written approval by the ARCHITECT and the DISTRICT REPRESENTATIVE. Any unused portion of the allowance shall be credited back to the District at the conclusion of the Project through a deductive change order to the Contract.
PROJECT MANUAL
SECTION 01100 - Summary

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this section.

1.2 Summary

A. Project Name: Health Sciences Building I.T. Server Room Renovation.
B. Project Location: Saddleback College, 28000 Marguerite Parkway, Mission Viejo, CA 92692-3635.
C. Owner: South Orange County Community College District, 28000 Marguerite Parkway, Mission Viejo, CA 92692-3635.
D. Owner's Representative: Walter Rice, Assistant Director Facilities Planning.
E. Architect: R²A Architecture, 2900 Bristol Street, Suite E-205, Costa Mesa, CA 92626.
F. The Work consists of the following:
   1. Redesign of existing mechanical and telecommunications system serving the I.T. Server Room on the Second Floor of the Health Sciences Building.
G. Provide all labor, materials, equipment, freight, taxes, services and administration to complete the Work.
H. The Bid Drawings and Specifications indicate the scope of the Work in terms of the design concept, the dimensions of the Work, and the elements of construction. The Bid Drawings and Specifications do not necessarily indicate or describe all Work required for the full performance and completion of the Work. Contractor shall be solely responsible for the inclusion of adequate amounts in the bid price to include all items, regardless of whether items are indicated, described, implied, or necessary in order to produce a completed Project. Decisions by the Owner’s Representative as to the items of Work included within the scope of these Drawings and Contract Documents shall be final and binding on the Contractor.

1.3 Type of Contract

A. Single Prime Contract

1.4 Use Of Premises

A. Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project. Perform Work so as not to interfere with Owner’s day to day operations. Limit construction operations to the following days and times:
   1. Monday through Friday. 7:00 a.m. to 5:00 p.m.
   2. Noise Generation Limitations: Monday through Friday, anytime before 8:00 a.m. and after 10:00 p.m. Saturday, anytime after 3:00 p.m. Sunday, anytime.
   3. The Contractor shall notify the Owner 2 weeks prior to the proposed scheduled use of the crane and shall be limited to one day on site. Crane access shall be limited to the south side of the
4. The Contractor shall notify the Owner 2 weeks prior to using the lay-down space. The exterior lay-down space identified on sheet A0.2 shall be available for a 2 week maximum time period. Contractor shall restore lay-down space to its original condition prior to turning over to Owner.

B. Schedule:

1. This project has a 120 day construction schedule.
   a. The following is list of the anticipated schedule with milestone dates.
      1) 8/1/2010: Notice to Proceed.
      2) 8/1/2010 through 9/10/2010: Order long lead items, process submittals, start work on roof.
      3) 8/15/2010 through 8/7/2010: Saddleback College Student Registration.
      4) 9/10/2010 through 11/22/2010: Start work in Server Room; Complete Project.
      7) 12/6/2010: Final Completion.

C. Power & Service Interruptions: The existing facility shall remain in operation throughout the duration of the project, except as follows:

1. Contractor must notify the owner 2 weeks in advance prior to shutting down power & service to the I.T. Server Room.
2. Power and service interruptions to I.T. Server Room 233 & the data equipment may only occur from 11pm to 6am Monday though Friday & any time during the weekend, between September 15th, 2010 and October 31, 2010.

D. Protection of Existing Equipment:

1. The contractor shall take all measures necessary to protect in place and keep all existing equipment free of dust, construction debris, excessive vibrations & heat build-up throughout the duration of construction.
2. The Telco termination racks, as identified on sheet A3.1, are extremely sensitive to vibration, which can cause the units to shut down and interrupt the I.T. service to the entire campus and shall be protected throughout the duration of the work. The Contractor shall provide a full height protective barrier around the Telco termination racks and coordinate all required clearances for air circulation, cooling and access points to the units with the Owner. Provide means for access to equipment, cooling, air circulation to the satisfaction of the Owner.

E. Security:

1. Contractor and all sub-contractors are required to carry access passes and are required to check-in and check-out at reception desk Room 200, near entrance to I.T. Server Room. Hours for Room 220 are 7:00 a.m. to 6:00 p.m. Monday through Friday.
2. Owner will issue temporary passes and lanyards for all contractors. Contractor is responsible to replace all lost or stolen passes.
3. Door leading into the I.T. Server Room must be kept secure at all times. Contractor may not leave door propped open.

F. Smoking is not permitted within Building or Site, or within 25 feet of entrances, windows or air intakes.
G. Prior to pre-construction meeting, submit written/graphic construction plan describing intended use of construction site. Coordinate with Owner to determine possible locations for the following items:

1. Daily work hours of construction personnel.
2. Parking area for construction personnel and visitors.
3. Staging area.
4. Delivery points.
5. Construction traffic patterns.
6. Construction office location.
7. Temporary toilet location.
9. Maximum number of workers expected in a single day.
10. Crane location.
11. Temporary utility connection location(s)
12. Soil stockpile areas.
15. Trash collection points.
16. Recycled material sorting areas.

H. Review plan at pre-construction meeting and revise per comments received at meeting.

I. Keep driveways and entrances serving premises clear and available to Owner, Owner’s employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

1. Schedule deliveries to minimize use of driveways and entrances.
2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

J. Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

K. Contractor is aware that building is occupied. Contractor must conduct operations to ensure least inconvenience to public and occupied areas in the building. Indicate adjacent building occupancy dates in construction schedule and coordinate construction activity with Owner.

1. Minimum noise impact on adjacent existing occupancies.
2. Minimum dust and debris impact on adjacent existing buildings and occupancies.
3. Maintain and provide pedestrian barricades and protection.
4. Maintain and protect exits from occupied areas at all times.

1.5 Owner's Occupancy Requirements

A. Owner reserves the right to place and install equipment in completed areas of Work, before Substantial Completion, provided such installation does not interfere with completion of the Work. Such placement of equipment shall not constitute acceptance of the Work, or substantial completion.

1.6 Specification Conventions

A. 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. Language used in the Specifications and other Contract Documents is abbreviated. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted
as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications and Drawings. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. 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.

PART 2 - Products (Not Used)

PART 3 - Execution (Not Used)

END OF SECTION 01100
SECTION 01250 - Contract Modification Procedures

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 Proposal Requests

A. Based upon Owner request or RFI responses Architect will issue a detailed description, Bulletin or Field Change Directive (FCD) of proposed changes in the Work that may require adjustment to the Contract Sum or Time. If necessary, the description will include revised Drawings and Specifications.

1. Proposed Changes issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within 20 days after receipt of Bulletin or FCD’s, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

   a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

   b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

   c. Include costs of labor and supervision directly attributable to the change.

   d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Use forms provided by Owner.

1.3 Allowances

A. To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place.

1. Include costs specified as part of the allowance. Provide documentation to substantiate change in allowance cost.

2. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

3. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount.

4. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.4 Change Order Procedures

A. On Owner's approval of a Proposal Request, issue a Change Order for signatures of Owner, Contractor and Architect on form approved by Owner.

B. Field Change Documents (FCD) shall be approved by DSA prior to order, fabrication, installation of products.
PART 2 - Products (Not Used)

PART 3 - Execution (Not Used)

END OF SECTION 01250
SECTION 01290 - Payment Procedures

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special conditions and other Division 1 Specification Sections, apply to this Section.

1.2 Schedule of Values

A. Submit Schedule of Values no later than 10 days prior to submittal of initial application of payment.

B. Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Include the following project identification on the Schedule of Values:

1. Project name and location.
2. Name of Architect.
3. Architect’s project number.
4. Contractor’s name and address.
5. Date of submittal.
6. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
7. Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Update and submit the Schedule of Values with each Application for Payment.
9. Arrange the Schedule of Values in tabular format with separate columns to indicate the following:
   a. Related specification sections.
   b. Description of Work.
   c. Name of Sub-Contractor.
   d. Approved change orders that affect value.
   e. Dollar value.
   f. Total contract sum of base contract.
   g. Total Contract sum with total of approved change orders added it.
10. Differentiate between items stored on site and items stored offsite. Include evidence of insured or bonded warehousing.

1.3 Applications For Payment

A. Make each Application for Payment consistent with previous applications and payments as certified by Architect and paid for by Owner. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment may involve additional requirements.

B. The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Submit Application for Payment to Architect on a day of each month agreed to by Owner, Contractor and Architect.
D. Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

E. Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Match data on the current Schedule of Values and current Construction Schedule.
   2. Include amounts of Approved Change Orders issued before last day of construction period covered by application.

F. Submit 4 (four) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. All copies shall include waivers of lien and other required attachments. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. With each Application for Payment, submit waivers and releases from every entity who is lawfully entitled to file a lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit conditional waiver and release upon progress payment on each item for amount requested in current application, after deduction for retainage, on each item.
   2. Submit an unconditional waiver and release on each item for the amount paid in the previous application, prior to deduction for retainage.
   3. When an application shows completion of an item, submit conditional waiver and release upon final payment.
   4. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   5. Submit waivers of lien on forms, executed in a manner acceptable to Owner.
   6. Within 7 (seven) days of receipt of payment that includes final payment on an item of Work, submit an unconditional waiver and release upon final payment for the item.

H. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors.
   2. Schedule of Values.
   3. Construction Schedule.
   5. List of Contractor's staff assignments.
   7. Copies of building permits.
   11. Certificates of insurance and insurance policies.
   12. List of subcontracts.

I. After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. Reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
J. Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Warranty and Maintenance information.
11. Record documents.

PART 2 - Products (Not Used)

PART 3 - Execution (Not Used)

END OF SECTION 01290
SECTION 01310 - Project Management and Coordination

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01700 “Execution Requirements.”

1.2 Definitions

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.3 Coordination

A. Coordinate all construction operations to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations that depend on each other for proper installation, connection, and operation. Establish and maintain clear communication between all trades.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

5. Provide and maintain sufficient crew to manage, supervise, execute and complete the Work by the required completion date.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

C. Coordinate scheduling and timing of required administrative procedures with construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Time progress meetings to coincide with review of payment applications. Such administrative activities include, but are not limited to, the following:

1. Preparation of Construction Schedule.

2. Preparation of the Schedule of Values.

3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.

5. Progress meetings.

6. Preinstallation conferences.

7. Project closeout activities.

8. Startup and adjustment of systems.

9. Project closeout activities.
D. Coordinate and check layout and installation of Work between all trades. Coordinate and sequence Work in a logical manner to minimize impact to Work in place.

E. Require all subcontractors to read and comply with all applicable requirements of the contract documents.

F. Carefully review all contract documents and promptly issue an RFI in writing noting errors, inconsistencies or omissions found, prior to starting any Work.

G. Field verify all dimensions needed for fabricated components.

H. Coordinate construction activities so that operations are carried out with consideration for efficient use of power, water and material.

I. Within 10 (ten) days of Notice to Proceed, submit a list of names for the following general contractor staff. List addresses, phone numbers, email addresses and fax numbers:

   1. Principal in charge.
   2. Project manager(s).
   3. Project superintendent(s).
   4. Key administrative staff.

1.4 Submittals

A. Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

   1. Include project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
      a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      b. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

   2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

   3. Number of Copies: Submit 6 (six) opaque copies of each submittal. Architect will return 4 (four) copies.

1.5 Project Meetings

A. Schedule and conduct meetings and conferences at Project site on a regular basis to coordinate the Work. Prepare agenda and lead the meeting. Issue meeting minutes to all concerned parties.

   1. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.

   2. Distribute the agenda to all invited attendees.

   3. Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 2 days of the meeting.
B. Schedule a preconstruction meeting before starting construction, at a time convenient to Owner and Architect, but no later than 10 working days after the date of the Notice to Proceed. Hold the meeting at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Discuss items of significance that could affect progress, including the following:
   a. Construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for RFIs.
   g. Procedures for Bulletins and Field Change Directives.
   h. Procedures for testing and inspecting.
   i. Procedures for processing Applications for Payment.
   j. Distribution of the Contract Documents.
   k. Submittal procedures.
   l. Preparation of Record Documents.
   m. Use of the premises.
   n. Work restrictions.
   o. Owner's occupancy requirements.
   p. Responsibility for temporary facilities and controls.
   q. Construction waste management and recycling.
   r. Parking availability.
   s. Office, work, and storage areas.
   t. Equipment deliveries and priorities.
   u. First aid.
   w. Progress cleaning.
   x. Working hours.

3. Record and distribute meeting minutes.

C. Conduct a preinstallation meeting at Project site for each construction activity required to have a pre-installation meeting.

1. Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner of scheduled meeting dates.

2. Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Lead time.
   f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Distribute minutes of the meeting to each party present and to all other concerned parties.
5. Do not proceed with installation if meeting cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Conduct regular progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Review and correct minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time. Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Work hours.
8) Quality and work standards.
9) Status of correction of deficient items.
10) Field observations.
11) RFIs.
12) Status of proposal requests.
13) Pending changes.
14) Status of Change Orders.
15) Pending claims and disputes.
16) Documentation of information for payment requests.

3. Record and distribute minutes of the meeting to each party present and to all other concerned parties.

E. The Owner’s Representative may call a special meeting at any time during the course of the project. Special project meetings shall include representatives of any members of the project team requested in order to discuss problems and/or solutions that are common to the project.

1.6 Requests For Interpretation (RFIs)

A. Immediately on discovery of the need for interpretation of the Contract Documents, prepare and submit an RFI in the approved form.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in the Work.
3. Review all RFIs with contract documents prior to submitting RFI to Architect to assure that necessary information is not in the contract documents. No time or schedule extension will be approved for RFIs when information is clearly shown in the Contract Documents.

B. Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution. If Contractor's solution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI. RFIs submitted without solution will be returned unreviewed, and no extension of time will be approved.
10. Contractor's signature.
11. Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
12. Enumerate each page and attachments of RFI with sequential number. Indicate total number of pages on RFI form.

C. Architect will review each RFI and determine action required. RFIs received after 3:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:
   a. Approval of Means and Methods.
   b. Requests for approval of submittals.
c. Requests for approval of substitution of products or alternate methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or RFIs with numerous errors.
h. RFIs which do not propose a solution.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 working days of receipt of the RFI response.

D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within one day if Contractor disagrees with response.

E. Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Include the following:
   1. Project name.
   2. Name of Contractor.
   4. RFI number including RFIs that were dropped and not submitted.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.

PART 2 - Products (Not Used)

PART 3 - Execution (Not Used)

END OF SECTION 01310
SECTION 01320 - Construction Progress Documentation

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this section.

B. Related Sections include:

1. Section 01290 “Payment Procedures.”
2. Section 01322 “Photographic Documentation.”

1.2 Definitions

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

B. CPM: Critical Path Method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Float: The measure of leeway in starting and completing an activity. Float time belongs to Owner.

E. Major Area: A story of construction, a separate building, or a similar significant construction element.

F. Milestone: A key or critical point in time for reference or measurement.

1.3 Submittals

A. Submittal Schedule: Submit 5 copies of submittal schedule.

B. Construction Schedule: Submit 5 opaque copies of initial schedule, large enough to show entire schedule for entire construction period. Submit an electronic copy of schedule in PDF format.

C. Daily Construction Reports: Submit 2 copies at weekly intervals.

D. Field Condition Reports: Submit 2 copies at time of discovery of differing conditions.

1.4 Coordination

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Construction Schedule with the Schedule of Values, Submittals Schedule and payment requests.
PART 2 - Products

2.1 Submittals Schedule

A. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates. Coordinate Submittal Schedule with Construction Schedule. Submit concurrently with submittal of Construction Schedule. Include the following:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

2.2 Construction Schedule

A. Extend schedule from date established for Notice to Proceed to date of Final Completion. Show the following dates and portions of time:

1. Notice to Proceed.
2. Completion Date.
3. Date of Substantial Completion.
4. Start and Finish dates for each Activity.
5. Critical Path.
6. Float Time.
7. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Treat each story or separate area as a separate numbered activity for each principal element of the Work.

1. Define and arrange activities so no activity is longer than 10 (ten) days.
2. Include procurement time for long lead items requiring more than 10 (ten) days procurement time, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery. Include procurement time within Activity time.
3. Include review and resubmittal times for submittals. Coordinate submittal review times in Construction Schedule with Submittals Schedule.
4. Include time necessary for startup and testing.
5. Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion. Show substantial completion date.

C. Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Arrange list of activities on schedule by phase.
2. Include a separate activity for each portion of the Work performed by Owner.
3. Show the effect of the following items on the schedule:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Uninterruptible services.
d. Partial occupancy before Substantial Completion.

e. Use of premises restrictions.


g. Seasonal variations.

h. Environmental control.

i. Required inspections.

4. Indicate important stages of construction for each major portion of the Work.

5. Include critical milestone dates such as Inspections and Completion dates.

D. For each proposed contract modification that affects contract time, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule. Submit analysis with proposed change.

E. Prepare Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work. Develop CPM schedule so it can be accepted for use within 7 (seven) days of submission of first payment application. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Owner/Architect approval of the schedule.

1. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

2. Use "one workday" as the unit of time. Include nonworking days and holidays in the schedule.

3. Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities.

4. Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

F. Prepare Schedule using a computerized program that has been specifically developed to products and manage CPM bar chart type schedules.

2.3 Reports

A. Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.

2. Equipment at Project site.

3. Material deliveries.

4. High and low temperatures and general weather conditions.

5. Accidents.


7. Meter readings and similar recordings.

8. Orders and requests of authorities having jurisdiction.

9. Services connected and disconnected.

10. Equipment or system tests and startups.

11. Number of workers on site.

B. Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions and photographs, together with recommendations.

C. When an event of an unusual and significant nature occurs at the project site, whether or not it is directly related to the Work, prepare and submit a report. List chain of events, individuals involved, photographs and written description.
PART 3 - Execution

3.1 Construction Schedule

A. Issue schedule at each regularly schedule progress meeting. At monthly intervals, update schedule to reflect actual construction progress and activities. Issue updated schedule with each Application for Payment.

B. Distribute copies of construction schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320
SECTION 01322 - Photographic Documentation

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 Submittals

A. Submit electronic copies of each photographic view within seven (7) days of taking photographs.

B. Identify each set of images on transmittal with the following information:
   1. Name of Project.
   2. Name of Contractor.
   3. Date stamped by camera.
   4. Unique sequential identifier.

C. Submit a complete set of digital image electronic files. Identify electronic media with date photographs were taken at time of Substantial Completion. Submit images that have same aspect ratio as the sensor, uncropped.

PART 2 - Products

2.1 Photographic Media

A. Provide images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, 150 DPI minimum.

PART 3 - Execution

3.1 Construction Photographs

A. Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

B. Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Include date and time in filename for each image.
   2. Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

C. Before commencement of the work, take color, digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.
   1. Flag construction limits before taking construction photographs.
   2. Take photographs to show existing conditions adjacent to property before starting the Work.
   3. Take photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs to record settlement or cracking of adjacent structures, pavements, and improvements.

D. Take periodic construction photographs one day before the cutoff date associated with each Application for Payment. Select vantage points to show status of construction, progress and adjacent properties since last photographs were taken.

E. Take digital color photographs of entire scope of Work at time of Substantial Completion. Submit photographs to Owner and Architect with transmittal.

F. Take color digital photographs of entire scope of Work at time of Completion. Submit photographs to Owner and Architect with each transmittal.

END OF SECTION 01322
SECTION 01330 - Submittal Procedures

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this section.

B. Related Sections include:

1. Section 01320 "Construction Progress Documentation."
2. Section 01400 "Quality Requirements."
3. Section 01770 "Closeout Procedures."
4. Section 01781 "Project Record Documents."
5. Section 01782 "Operation and Maintenance Data."

1.2 Definitions

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 Submittal Procedures

A. Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
3. Do not use submittals to obtain approval of substitutions and alternate methods.
4. Do not use submittals to obtain approval of means and methods.

B. Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Allow for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Allow for review of each resubmittal.

C. Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 x 8 inches on label or beside title block to record action taken by Architect.
3. Include the following information on label for processing and recording action taken:

   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name and address of Contractor.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

D. Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals. If submittals contain comparable products equal to or exceeding specified basis of design products provide side-by-side comparison of all attributes between proposed product and specified product. Include side-by-side comparison within submittal, submittals for comparable products without side-by-side comparisons will be rejected.

E. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Do not group separate submittals under a single transmittal and single submittal number. Rejection of one portion of a submittal will be a rejection of the entire submittal. Architect will return submittals, without review, received from sources other than Contractor. Use transmittal form supplied by Architect.

F. Make resubmittals in same form and number of copies as initial submittal.

   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.

G. Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

H. Use only final submittals indicating Architect’s ‘acceptance’ or ‘furnish as corrected’ without a requested resubmittal.

1.4 Contractor's Use Of Architect's Cad Files

   A. Contractor is not allowed to use Architect’s CAD files, or printed copies of Architect’s drawings, for use in preparing submittals.

PART 2 - Products

2.1 Action Submittals

   A. Prepare and submit Action Submittals required by individual Specification Sections.

   B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment. Provide adequate information in each submittal so that reviews may be conducted efficiently.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Manufacturer's catalog cuts.
   e. Wiring diagrams showing factory-installed wiring.
   f. Printed performance curves.
   g. Operational range diagrams.
   h. Compliance with specified referenced standards.
   i. Testing by recognized testing agency.
4. Submit six (6) copies of Product Data, unless otherwise indicated. Architect will return four (4) copies. Retain one (1) returned copy as a Project Record Document. Provide one (1) returned copy to Owner; Provide one (1) returned copy to IOR.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Dimensions.
   b. Identification of products.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
   f. Shopwork manufacturing instructions.
   g. Templates and patterns.
   h. Schedules.
   i. Notation of coordination requirements.
   j. Notation of dimensions established by field measurement.
   k. Relationship to adjoining construction clearly indicated.
   l. Seal and signature of professional engineer if specified.
   m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
2. Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Submit six (6) opaque (bond) copies of each submittal. Architect will return four (4) copies. Retain one (1) one returned copy as a Project Record Document. Provide one (1) returned copy to Owner; Provide one (1) returned copy to IOR.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Attach label on unexposed side of Samples that includes the following:
a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Submittal number.
e. Contractor’s review and approval stamp and signature.

3. Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

4. Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Submit [six (6)] full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return [four (4)] submittals with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
   a. Submit [six (6)] sets of verification Samples. Architect will retain [four (4)].

2.2 Informational Submittals

A. Prepare and submit Informational Submittals required by Specification Sections.
   1. Submit [six (6)] copies of each submittal.
   2. Provide a notarized statement that includes signature of entity responsible for preparing certifications. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

D. Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

E. Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

F. Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

G. Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
H. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

I. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

J. Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

K. Prepare written or published information that documents manufacturer's written recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

L. Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
   2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   3. Results of operational and other tests and a statement of whether observed performance complies with requirements.

M. Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

N. Submit Material Safety Data Sheets (MSDSs) directly to Owner; do not submit to Architect. Architect will not review submittals that include MSDSs and will return them unreviewed for submittal to Owner.

2.3 Delegated Design and Deferred Approvals

A. Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated. If criteria indicated are not sufficient to perform design services or certification required, submit written RFI.

B. In addition to Shop Drawings, Product Data, and other required submittals, submit [seven (7)] copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, structural loads, and other factors used in performing these services.

C. If any portion of Work is designated as “Deferred Approval” item, provide preparation of design, drawings and calculations to substantiate design in a timely manner to not delay or hinder Work.
   1. Coordinate “Deferred Approval” items with all other related and interfacing Work.
   2. Provide a registered Engineer stamp on all drawings and calculations.
   3. Submit design to Architect for review.
   4. After review and acceptance by Architect, submit to Building and Fire Official for approval.
5. Allow for Architect’s review time and Building and Fire Official’s processing and approval in Construction Schedule.
6. Allow for necessary correction time and resubmittals.

2.4 Subcontract List

A. Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who furnish products, equipment or fabrications. Include the following in tabular format:

1. Name, address, telephone number, email and fax number.
2. Number and title of related specification section.
3. License number and grade of license.
4. Submit copies to Architect at time of first application for payment.
5. Retain [one (1)] returned copy as Record Document. Provide [one (1)] returned copy to Owner. Provide [one (1)] returned copy to IOR.

PART 3 - Execution

3.1 Contractor's Review

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect. Place approval stamp on body of submittal, do not place approval stamp on binding cover.

B. Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 Architect's Action

A. Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Architect will review each action submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action necessary. Submittals will only be reviewed for conformance with design intent and information in the Contract Documents.

C. Architect will review each informational submittal and will return it without action.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and will be discarded.

F. All reviewed submittals will be returned to Contractor.

G. After two submissions, without acceptance, of a particular submittal, Contractor will bear expense for additional Architect review of that submittal, through deductive change order.

H. Include all costs for preparing and handling submittals including costs associated with printing and distribution of submittals to a subcontractor.

Submittal Procedures
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SECTION 01400 - Quality Requirements

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 Definitions

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by a qualified testing agency acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
I. Testing Agency: A professionally licensed entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

K. ‘Minimum experience’ means having successfully completed a minimum of [five (5)] years’ experience on projects similar in size and scope of the type of Work required for this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

L. IOR: Inspector of Record.

M. DSA: California Division of State Architect.

N. OAR: Owner’s Authorized Representative

O. CBC: California Building Code.

1.3 Conflicting Requirements

A. If compliance with two or more standards or code requirements is specified and the standards or code requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement at no additional cost to Owner. When uncertainties exist and requirements are different, but apparently equal, submit RFI's to Architect for a decision before proceeding.

B. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. When uncertainties exist submit RFI to Architect for a decision before proceeding.

C. When conflicts exist within drawings provide Architect with RFI for clarification and provide more expensive option at no additional cost to Owner.

D. When conflicts exist within specifications provide Architect with RFI for clarification and more expensive option at no additional cost to Owner.

E. When conflicts exist between drawings and specifications provide Architect with RFI for clarification and more expensive option at no additional cost to Owner.

F. If conflicts exist between code requirements, authorities having jurisdiction and contract documents provide RFI to Architect for clarification and provide more expensive option at no additional cost to Owner.

1.4 Submittals
A. For testing agencies retained, submit proof of qualification to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results with interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Name and signature of laboratory inspector.
12. Recommendations on retesting and reinspecting.

C. For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 Quality Assurance

A. Provide firms and individuals experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

B. Provide firms and individuals experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Provide firms and individuals experienced in producing and fabricating products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Provide the services of professional engineers who are legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for design and installation of the systems, assemblies, or products that are similar to those indicated for this Project in material, design, and extent.

E. Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated. Requirement for specialists shall not supersede building codes and regulations governing the Work.

F. When required, provide an authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
G. Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect 7 (seven) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed.

H. Any additional Work beyond that specified or illustrated, or any modifications thereto, that are necessary for the furnishing of required warranty shall be provided by the Contractor without additional cost to the Owner.

1.6 Quality Control

A. Owner will select an independent testing agency to conduct tests, sampling, and testing of materials. Selection of material to be tested shall be by the agency or the IOR and not by Contractor. Owner will engage a qualified testing agency and special inspectors to conduct special tests and inspections required by authorities having jurisdiction. Special inspections are indicated in the Contract Documents.

1. Procedural and acceptance criteria shall be as set forth in Section 4-335 of the California Building Standards Administrative Code and as set forth in CBC Section 1703A.1.

B. Owner will directly reimburse testing agency for all costs for all Building or Fire Official required tests and inspections, but may be reimbursed by Contractor for such costs as noted in related sections of the Contract Documents.

1. Contractor will reimburse Owner or directly reimburse testing agency for all costs for retesting required by failed tests as set forth in Sections 4-333(c) and 4-335(c) of the California Building Standards Administrative Code.

C. Independent testing agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

D. Independent testing agency shall not perform any duties of Contractor.

E. Contractor shall notify the Owner a sufficient time in advance of the manufacture of material to be supplied by Contractor as required under the Contract Documents, which must by terms of the Contract Documents be tested, in order that the Owner may arrange for the testing of same at the source of supply.

F. Any material shipped by Contractor from source of supply prior to having satisfactorily passed required testing and inspection shall not be incorporated into the Work.

G. Contractor shall provide an insulated curing box with capacity for not less than one set of concrete cylinders and relocate curing box and cylinders as rapidly as required in order to provide for progress of the Work.

H. Where indicated, engage a factory-authorized service representative to inspect substrates, field-assembled components and equipment installation, including service connections. Report results in writing to Owner and Architect.
I. Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with Contract Documents.

J. Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

K. Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting. Schedule time for tests, inspections, obtaining samples, and similar activities.

PART 2 - Products (Not Used)

PART 3 - Execution

3.1 Testing and Inspection Log

A. Maintain a testing and inspection log at Project site. Post changes and modifications as they occur. Provide access to log by Architect, IOR and Owner.

3.2 Repair And Protection

A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with requirements of Section 01731 "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

3.3 Test Reports

A. One copy of each test report shall be forwarded directly to Building and Fire Official by the testing agency. Additional copies of each test report shall be forwarded directly to Owner, Architect, Contractor, project inspector, construction manager, and structural engineer by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reports. Reports shall show that the material or materials were sampled and tested in accordance with the requirements of CBC, Title 24, Parts 1 and 2, and with the
approved Contract Documents. Test reports shall show the specified design strength. Test reports shall also state whether or not material or materials tested comply with the specified requirements as set forth in Section 4-335(d) of the California Building Standards Administrative Code.

3.4 Verification of Test Reports

A. Testing agency shall submit to DSA a verified report, in duplicate, covering tests that were performed by that agency during the progress of the Work. Additional copies of each test report shall be forwarded directly to Owner, Architect, Contractor, project inspector, construction manager, and structural engineer by the testing agency. Such report shall be furnished each time construction on the Work is suspended, covering tests up to that time, and prior to Final Completion of the Work, covering all tests as set forth in Sections 4-335(e) and 4-336 of the California Building Standards Administrative Code.

3.5 Site Visitations

A. Owner, Architect and IOR shall have access to the site at all times, to all parts of the Work and to all shops/warehouses where materials or Work is in preparation, fabrication or storage.

B. Owner, Architect and IOR shall have the right to reject materials and workmanship deemed defective Work, and to require their correction. Rejected work and materials shall be corrected in a satisfactory manner without charge to Owner. If Contractor does not correct rejected Work within a reasonable time, fixed by written notice and in accordance with the terms and conditions of the Contract Documents, Owner may correct rejected Work and recover design, engineering, repair, replacement and administrative costs through deductive change order.

C. The Owner at any time prior to Final Completion reserves the right to make an examination of Work already completed by removing work in place. The Contractor shall, on request, promptly furnish all necessary facilities, labor, and materials. If Work is found to be defective in any respect due to the fault of the Contractor all expenses of such examinations and of satisfactory reconstruction will be at the Contractor’s expense. If Work is found to meet the requirements of Contract Documents, the additional cost of examination and replacement shall be paid for by Owner.

D. Contractor is responsible for compliance with all applicable local, state, and federal codes, regulations, ordinances, restrictions, and requirements.

3.6 Inspector of Record

A. Project Inspector of Record (IOR), employed by the Owner in accordance with requirements of California Code of Regulations, Title 24, will be assigned to the Work.

1. Project inspector shall be approved by Architect, Structural Engineer, and DSA.
2. As set forth in Section 4-333(b) of the California Building Standards Administrative Code.
3. Duties of project inspector are specifically defined in Section 4-342 of the California Building Standards Administrative Code.

B. The Work shall be subject to the personal continuous observation of the IOR. He shall have free access to any or all parts of the Work at any time.

C. Inspection of Work shall not relieve Contractor from obligation to fulfill all of the terms and conditions of the Contract Documents.

D. Contractor shall be responsible for scheduling times of inspection, tests, sample taking, and similar activities of the Work.

Quality Requirements

01400 - 6
E. The Contractor shall provide a temporary office for the IOR to be located as directed by the IOR and to be maintained until removal is authorized by the Owner. This office shall be of substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. The door shall have a lock. A table satisfactory for the study of plans and two chairs shall be provided by the Contractor. The Contractor shall provide and pay for adequate electric lights, private local telephone service with a loud exterior bell, internet DSL service, fax machine with active line, and adequate heat and cooling for this field office until the completion of the Contract.

END OF SECTION 01400
SECTION 01420 - References

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this section.

1.2 Definitions

A. Basic Contract definitions are included in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

E. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

F. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

G. "Provide": Furnish and install, complete and ready for the intended use.

H. "Project Site": Space available for performing construction activities. The extent of Project site may or may not be identical with the description of the land on which Project is to be built.

1.3 Industry Standards

A. Unless the Contract Documents include more stringent requirements, applicable reference standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference. In case of conflict between performance standard or regulation and contract documents provide more stringent requirement at no additional cost to Owner.

B. Comply with standards in effect as of date of the Contract Documents.

C. Comply with all conditions of approval from governing authorities.

D. In case of conflict between reference standards or reference standards and governing authorities, conform to the most stringent requirements, if such conformance is legal, at no additional cost to Owner.
E. The contractual relationship and responsibilities of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

F. Each entity engaged in construction on Project shall be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source. Maintain a copy of all applicable regulations and reference standards at the project site.

G. Where abbreviations and acronyms are used in Contract Documents, they shall mean the recognized name of the entities in the following list. This list is not inclusive of all organizations.

- ACI: ACI International (American Concrete Institute)
- ADA: Americans with Disabilities Act
- AISC: American Institute of Steel Construction
- AISI: American Iron and Steel Institute
- AITC: American Institute of Timber Construction
- ANSI: American National Standards Institute
- APA: APA - The Engineered Wood Association
- ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers
- ASTM: American Society for Testing and Materials International
- AWS: American Welding Society
- CRSI: Concrete Reinforcing Steel Institute
- DHI: Door and Hardware Institute
- FED-STD: Federal Standard
- FS: Federal Specification
- MILSPEC: Military Specification and Standards
- NES: National Evaluation Service (See ICC-ES)
- NFPA: National Fire Protection Association
- NRCA: National Roofing Contractors Association
- SMACNA: Sheet Metal and Air Conditioning Contractors' National Association
- TCA: Tile Council of America, Inc.
UL Underwriters Laboratory

WI Woodwork Institute

PART 2 - Products (Not Used)

PART 3 - Execution (Not Used)

END OF SECTION 01420
SECTION 01500 - Temporary Facilities and Controls

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:
   1. Section 01700 "Execution Requirements."

1.2 Use Charges

A. Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner’s construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Coordinate with owner to determine point of connection.

C. Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Coordinate with owner to determine point of connection.

1.3 Quality Assurance

A. Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.4 Project Conditions

A. Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Provide barricades to protect pedestrian traffic around site.

C. Respond to complaints from Owner within 48 hours.

D. Provide immediate written RFI summarizing complaints received directly from neighbors.

E. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.
F. Contractor is responsible for site, building and individual room security, and security to all areas of work.

PART 2 - Products

2.1 Materials

A. Comply with Sections 02741 and 02751 for Asphalt Paving and Concrete Paving.

B. Portable Chain-Link Fencing: Minimum 2-inch, 9 Ga., galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide privacy screen in fence and gates. Contractor is responsible for realigning, relocating and reestablishing temporary fence, privacy screen, and gates as required to accommodate access, circulation and progress of Work.

C. Provide necessary construction grade lumber and CDX plywood in sizes and thickness needed.

D. Provide ½" regular gypsum board as needed

E. Provide materials as indicated for temporary construction sign.

F. Provide 10-mil minimum polyethylene sheeting as needed to protect and screen work.

G. Provide paint as needed to comply with VOC requirements.

H. Provide sandbags as required.

I. Provide plastic sheeting as required, 10-mil polyethylene.

J. Provide First Aid supplies.

K. Provide security hardware to secure portions of the site and building as specified.

2.2 Temporary Enclosures

A. Prefabricated occupiable units with serviceable finishes, heating and air conditioning temperature controls, and foundations adequate for normal loading.

B. Provide storage sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations. Keep materials dry at all times.

2.3 Equipment

A. Provide portable, UL rated fire extinguishers; with class, & extinguishing agent and in quantity & location as required by fire authority. Provide and maintain fire extinguishers in wood construction regardless of Fire Authority requirements.

B. Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

2. Provide heating units listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Provide filter with MERV of 8 (eight) at each return air grille in system and remove at end of construction.

C. Locate, place and use equipment so as not to impose excessive loads on supporting walls, floors, roofs and structures.

PART 3 - Execution

3.1 Installation, General

A. Locate temporary facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 Temporary Utility Installation

A. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Provide temporary utilities to remove effluent lawfully. Connect temporary sewers to [municipal system] [private system indicated] as directed by authorities having jurisdiction.

C. Install water service and distribution piping in sizes and pressures adequate for construction.

D. Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

E. Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

F. Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

H. Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

I. Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install temporary electric power service underground.
J. Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

K. Provide temporary telephone service in common-use facilities. Install a minimum of one (1) telephone line for each field office.
   1. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
   2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

L. Provide temporary electronic DSL communication service, including electronic mail in each field office.

3.3 Support Facilities Installation

A. Provide construction offices, shops, and sheds. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
   1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
   2. Recondition temporary use areas, including removing contaminated material, regrading, proofrolling, compacting, and testing.
   3. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Asphalt Paving Specifications.

C. Comply with traffic control requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.
   3. Provide Owner and authorities having jurisdiction with a minimum 7 day notice of traffic/street closure and re-routing. Coordinate with all parties concerned on allowable and preferred closure times.

D. Temporary parking passes will be provided by Owner. All construction personnel shall part in Lot No. 5.

E. Provide Project identification sign as indicated on drawings and other temporary signs as necessary for completion of the Work. Locate temporary signs to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
   1. Provide temporary, directional signs for construction personnel and visitors.
   2. Maintain and touchup signs so they are legible at all times.

F. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
G. Provide facilities necessary for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

H. Use of Owner's existing elevators will not be permitted. Contractor shall use building stairs identified on Sheet A0.2 and A1.1.
   1. Provide protective coverings, barriers, devices, signs, or other procedures to protect walls, floors, doors and door frames. If, despite such protection, damage occurs, restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required at no additional cost to Owner.

I. Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work at no additional cost to Owner.

J. Cover finished permanent stairs with protective covering of rosin paper, plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 Security and Protection Facilities Installation

A. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Engage pest-control service to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

C. Provide floor-to-ceiling temporary dustproof partitions to limit dust and dirt migration and to separate in-use occupied areas from fumes and noise.
   1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, over 20 gauge metal studs 16" o.c. with fire-retardant plywood on construction operations side.
   2. Insulate partitions.
   3. Seal joints and perimeter.

D. Provide and maintain temporary fire protection facilities of types needed to protect against reasonably predictable fire losses.

3.5 Operation, Termination, and Removal

A. Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintain facilities in good operating condition until removal. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
D. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements.

END OF SECTION 01500
SECTION 01524 - Construction Waste Management

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01732 “Selective Demolition.”

1.2 Definitions

A. Construction Waste: Materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 Performance

A. The Owner has established that this Project shall generate the least amount of landfill waste possible and that processes that ensure the generation of as little landfill waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.

B. Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be recycled. Waste disposal in landfills shall be minimized.

C. Owner’s goal is to recycle as much nonhazardous demolition and construction waste as possible.

D. Field verify dimensions indicated on construction documents before confirming product orders or proceeding with Work, to minimize waste due to excessive materials.

1.4 Quality Assurance

A. Comply with hauling and disposal regulations of authorities having jurisdiction.
1.5 Delivery, Storage and Handling

A. Coordinate the schedule of product deliveries in order to minimize site storage time and potential damage to stored materials and to minimize waste due to excessive materials handling and misapplication.

B. Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

C. Store products and materials in a manner to prevent damage and contamination.

PART 2 - Products (Not Used)

PART 3 - Execution

3.1 Salvaging Demolition Items

A. Salvaged Items for Reuse in the Work:
   1. Clean salvaged items.
   2. Store and protect items in a secure area until installation.
   3. Protect items from damage during transport.
   4. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
   5. Keep items dry at all times.

B. Salvaged Items for Owner's Use:
   1. Clean salvaged items.
   2. Store and protect items in a secure area until delivery to Owner.
   3. Transport items to Owner's storage area designated by Owner.
   4. Protect items from damage during transport.
   5. Keep items dry at all times.

3.2 Recycling Waste

A. Arrange for timely pickups from the site and deliveries to recycling facility in order to prevent contamination of recyclable material. Designate specific areas for separation and storage of salvaged and recycle materials. Keep areas neat and clean, in an orderly manner, and well labeled.

B. Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   2. Remove recyclable waste off Owner’s property daily and transport to recycling receiver or processor.

C. Stack large clean gypsum board pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners. Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
D. Stack large clean acoustical ceiling panels and tiles on wood pallets and store in a dry location. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.

E. Packaging:
   1. Break down packaging and cardboard into flat sheets. Bundle and store in a dry location.
   2. Separate and bag Polystyrene Packaging materials.
   3. As much as possible, require deliveries using pallets to remove pallets from Project site daily.
   4. Collect beverage containers and paper waste used by onsite workers and sort by material.

3.3 Disposal of Waste

A. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site daily and legally dispose in a landfill acceptable to authorities having jurisdiction.
   1. Do not allow landfill waste materials that are to be disposed of to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces, site areas, and routes of transport.
   3. Transport landfill waste materials off Owner’s property and legally dispose of them.

B. Do not burn waste materials.

End of Section 01524
SECTION 01600 - Product Requirements

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01770 “Closeout Procedures.”

1.2 Definitions

A. Products: Items purchased for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

C. Specific manufacturer names or product names noted as “or equal” are referenced to establish basis of design requirements for quality, properties, function, dimensions, instances, performance, physical properties, appearance, and other characteristics for the purposes of evaluating comparable products by other manufacturers. Comply with submittal requirements for submitting comparable products on an ‘or equal’ basis. Listed manufacturers are provided as a suggested guide and are not intended to limit Contractor’s choices of manufacturers. Contractor is responsible for providing products that meet the basis of design in every respect and providing required submittal information to demonstrate compliance.

1.3 Substitution Procedure

A. Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use facsimile of form provided by Architect.
2. Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or method cannot be provided.
b. List of changes or modifications needed to other parts of the Work that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports acceptable to authority handling jurisdiction, evidencing compliance with building code in effect for Project.
i. Detailed evaluation of Construction Schedule showing effect on the overall Contract Time and individual tasks. If specified products are not available from manufacturer within
scheduled construction time, provide written statement on manufacturer’s letterhead stating lack of availability or timing of delivery.

j. Cost implication, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. If necessary, Architect will request additional information or documentation for evaluation of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution. Use product specified if Architect cannot make a decision on use of a proposed substitution.

4. Do not install substituted products without acceptance from Owner and Architect.

5. Contractor is responsible for providing all necessary information including information requested by Architect to justify substitution.

6. Do not resubmit rejected substitutions.

7. Use of approved substitution does not alleviate Contractor from complying with requirements of Contract Documents.

8. Allow for all substitution request and review times in construction schedule. Additional schedule time will not be granted for substitutions.

1.4 Quality Assurance

A. If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

B. Do not incorporate products that are provided prior to satisfactorily passing testing requirements.

C. Provide all products required for a complete and proper installation even if not specifically indicated.

D. Where inter-related, multiple components are required for a complete system provide components that are completely compatible and satisfy required warranties. Provide only one brand, kind or make of product for each purpose throughout Work.

E. For all products referred to in singular number, provide the quantity needed to complete the Work.

1.5 Product Delivery, Storage, And Handling

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions. Exercise special care to protect products that are sensitive to light, UV exposure, heat or moisture.

B. Delivery and Handling:

1. Schedule and sequence deliveries with construction schedule to minimize storage time at Project site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Promptly inspect products on delivery to ensure compliance with Contract Documents and to ensure that products are undamaged and properly protected.
5. Provide adequate equipment and personnel to properly handle, move and store products and materials to prevent damage, disfiguring or soiling.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, and UV exposure, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage. Comply with MSDS.
7. Protect stored products from damage and liquids from freezing.
8. Do not bring products to site until conditions match those recommended in writing by manufacturer.
9. Do not store products labeled flammable or toxic within the building.
10. Store products in a secure enclosure.
11. When approved by Owner, and when site constraints do not permit on-site storage, materials may be stored off site in a bonded warehouse approved by Owner, at no additional cost to Owner.
12. Store granular materials on a solid flat surface in a well drained area.
13. Arrange storage area to allow access for inspections and for logical sequencing with construction.

1.6 Product Warranties

A. Special warranties specified shall be in addition to manufacturer’s standard warranties or implied warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Where special warranties are required prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval as submittal. Even when not specifically indicated as a submittal within a specific Specification Section.

1.7 Owner Furnished Items

A. Installation of owner furnished contractor installed (OFCI) items indicated, shall be complete in every detail.

B. OFCI items will be delivered to the site by Owner. Receive, unload and store OFCI items in a secured, covered, dry storage area. OFCI items damaged during storage, handling or installation shall be repaired or replaced to the satisfaction of the owner at the contractor’s expense. Contractor shall open and inspect OFCI items within [one (1)] day of receipt.

C. Coordinate with Owner’s forces for delivery, handling and timing of installation of Owner furnished Owner installed (OFOI) items.
1.8 **Owner-Installed Products**

A. Provide access to Project site for Owner's construction forces.

B. Coordinate construction and operations of the Work with work performed by Owner's construction forces.

1. Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

2. Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation meetings conducted by Owner's construction forces if portions of the Work depend on, or are inter-related with Owner's construction.

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**PART 2 - Products**

2.1 **Product Selection**

A. Provide products that comply with the Contract Documents that are undamaged and new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

3. ‘Or Equal’ basis-of-design: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product that is equal in all respects. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.

4. Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

5. Where Specifications include the phrase "as selected from manufacturer's colors, patterns, and textures" or a similar phrase, Architect will select color, pattern, density, or texture from manufacturer’s full range of products that includes both standard and premium items.

6. Where a conflict exists between two different products specified to the same piece of work, provide the more expensive product at no additional cost to Owner.

7. Where conflict exists between product requirements indicated and jurisdictional requirements provide for more expensive option at no additional cost to Owner.

8. Where conflict exists between specifications and drawings for product requirements provide more expensive product at no additional cost to Owner.

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2.2 **Product Substitutions**

A. Architect will consider requests for substitution if received within 30 (thirty) days after the Notice to Proceed. Requests received after that time may or may not be considered at discretion of Architect.

B. Architect will consider Contractor's request for substitution only when the following conditions are satisfied:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume.

2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated by Contractor with other portions of the Work.
9. Requested substitution provides specified warranties.

C. Contractor is responsible for providing all information necessary and requested to justify substitution request.

D. Substitution requests and processing shall in no way justify additional time or money to the Contract.

E. Substitution requests that are denied shall in no way justify additional time or money to the Contract.

F. Approved substitutions shall in no way relieve Contractor from requirements and responsibilities of the Contract Documents.

G. Contractor assumes all costs associated with processing proposed substitutions and for installing approved substitutions.

H. Substitutions on the basis of unavailability of a product must be accompanied by letter on manufacturer's letterhead stating lack of availability.

I. Contractor shall pay all professional fees, including Architect and Engineers, for time required for review and any redesign services associated with substitutions and for costs associated with re-approval by Government Authority. Costs shall be paid by deductive change order to Contract.

J. Substitutions will not be considered when they are indicated or implied on submittals. All proposed substitutions must be requested with separate written requests.

PART 3 - Execution (Not Used)

END OF SECTION 01600
SECTION 01700 - Execution Requirements

PART 1 - General

1.1 Related Documents
A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.
B. Related Sections include:
   1. Section 01310 "Project Management and Coordination."
   2. Section 01330 "Submittal Procedures."
   3. Section 01731 "Cutting and Patching."
   4. Section 01770 "Closeout Procedures."

1.2 Submittals
A. Provide Qualification Data for licensed surveyor to be used on the Project.
B. Submit certificate signed by licensed surveyor certifying that location and elevation of improvements comply with requirements.
C. Submit 2 (two) copies of a final property survey showing the project layout Work performed and record survey data, including finish floor elevations and building location.

1.3 Quality Assurance
A. Obtain the services of a licensed land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
B. Provide installers practicing the best methods known to each particular trade. Use adequate numbers of skilled, experienced workers who are adequately trained and completely familiar with the requirements and methods needed for completion of the Work.
C. Where required by warranty requirements provide approved fabricators and installers. Provide written evidence of such approval on manufacturer’s letterhead from manufacturer.

PART 2 - Products (Not Used)

PART 3 - Execution

3.1 Examination
A. The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work. Before construction, verify the location and points of connection of utility services.
B. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. If requirements of Contract Documents create conditions which are detrimental to performance of the Work provide an RFI to the Architect.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers, curing compounds and other finishes and coatings. Assure that moisture content of substrate is within acceptable written recommended limits of manufacturer of material to be applied to substrate.

3. Examine and verify rough-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

4. Examine and verify suitability of walls, floors, roofs and other elements to accept application and installation of products and systems.

5. Verify that conditions do not negate required warranties.

6. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 Preparation

A. Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before order and fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Verify space requirements and dimensions of items shown diagrammatically on Drawings prior to order and fabrication.

C. Review field conditions with Contract Documents. Immediately on discovery of the need for clarification of the Contract Documents; submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 Construction Layout

A. Before proceeding to lay out the Work, verify project dimensions and location shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, provide and RFI to the Architect immediately.

B. Engage a licensed surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

2. Establish dimensions within tolerances indicated. Do not scale Drawings or use means to measure or obtain required dimensions from electronic drawings, use written dimensions only.

3. Inform installers of lines and levels to which they must comply.

4. Check the location, level and plumb, of every major element as the Work progresses.

5. Notify Architect with written RFI immediately when deviations from required lines and levels exceed allowable tolerances.

C. Locate and lay out improvements.

D. Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.
3.4 Field Engineering

A. Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points. Report in writing lost or destroyed permanent benchmarks or control points promptly.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Establish and maintain a minimum of 2 (two) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 Installation

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, conduit and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance required by building authority in spaces without a ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated. Install products in a manner that satisfies warranty requirements and is recommended in writing by manufacturer.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion. Prepare substrates and surfaces as recommended in writing by manufacturer. Perform Work when existing and forecasted weather conditions are within limits recommended in writing by manufacturer. Comply with manufacturer’s written temperature and humidity requirements. Allow materials to adjust to ambient conditions as recommended by manufacturer in writing prior to installation.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Do not use tools or equipment that produce harmful noise levels to building occupants.

F. Obtain and distribute templates to parties involved for factory prepared and field installed Work. Check Shop Drawings and coordinate with other work to confirm that adequate provisions are made for locating and installing fabricated products.

G. Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
1. Where mounting heights are not indicated, submit an RFI to verify mounting heights.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Make joints of uniform width. Where joint locations in exposed work are not indicated, submit RFI to verify joint location. Measure, layout, plan, cut and fit exposed connections together to form hairline joints.

I. After sub-contractors and trades have completed work, inspect work and adjacent areas and make any adjustments necessary.

J. Use products, cleaners, and installation materials that are not considered hazardous, and are fully compatible with installed products and finishes.

3.6 Progress Cleaning

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
2. Do not hold waste materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Do not store unsanitary or unsafe waste inside building.
5. Do not store flammable, unsafe, unsanitary or odorous waste in a manner or location that would adversely affect pedestrians, building occupants, adjacent buildings and occupants, and properties.

B. Maintain Project site free of loose, scattered waste materials and debris.

C. Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, vacuum the entire work area, as needed.
3. Project area is very sensitive to dust. Contractor shall contain and control dust to maintain a dust free environment within the building.

D. Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Remove debris from concealed spaces before enclosing the space.

F. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Burying or burning waste materials on-site is not permitted. Washing waste materials down sewers or into waterways is not be permitted.
H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 Starting and Adjusting

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 Protection of Installed Construction

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 Correction of The Work

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 01731 "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace entire area of finish materials that are exposed to view if damaged surfaces cannot be repaired without visible evidence of repair.

D. Remove and replace damaged substrates and base structure if damaged by construction operations.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700
SECTION 01731 - Cutting and Patching

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

   1. Section 07841 “Through-Penetration Firestop Systems.”

1.2 Submittals

A. Submit a proposal describing procedures at least 10 (ten) days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

   1. Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
   2. Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
   3. List products to be used and firms or entities that will perform the Work.
   4. Indicate when cutting and patching will be performed.
   5. List utility services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
   6. Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
   7. Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work. Do not cut and patch structural elements without approval from Architect.

1.3 Quality Assurance

A. Do not cut, drill or notch structural elements unless detailed on structural drawings or without prior written authorization from the Structural Engineer.

B. 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, decreased operational life or safety, or voids required or implied warranties.

C. Do not cut and patch elements or related components in a manner that results in reducing their load carrying capacity, capacity to perform as intended, causes increased maintenance or decreased operational life or safety, or voids required or implied warranties.

D. 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 patch in a visually unsatisfactory manner.

E. Sloppy, careless or avoidable cutting and patching will not be tolerated and work affected will be replaced at no cost to Owner. An aesthetically pleasing overall appearance of finished surfaces is a
requirement of this Project. Make necessary preparations, and use recommended techniques with great care to ensure that all finished surfaces are acceptable to Architect. Architect will be the sole judge of visual acceptability.

F. Before cutting and patching meet at Project site with parties involved including mechanical and electrical trades. Review areas of proposed cutting and patching, coordinate procedures and resolve conflicts before proceeding.

1.4 Warranty

A. Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials approved in writing by manufacturer’s of affected materials, so as not to void warranties. Architect will be the sole judge of visual acceptability.

PART 2 - Products

2.1 Materials

A. Comply with requirements specified in other Sections.

B. Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible. 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. Architect will be sole judge of visual acceptability.

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. Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 Preparation

A. Provide temporary support of Work to be cut.

B. 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. Avoid interfering with use of adjoining areas or interrupting the free passage to adjoining areas.

D. Where existing utility 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. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay. Cut in-place construction to provide for installation of other
components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cut in-place construction by sawing, drilling, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

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. Cut or drill from the exposed or finished side into concealed surfaces.
3. Cut concrete and masonry using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. For excavating and backfilling comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. 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. Test and inspect patched areas after completion to demonstrate integrity of installation.
2. 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.
3. Provide an even surface of uniform finish, color, texture, and appearance. Remove finishes and replace with new materials, if necessary as determined by Architect, to achieve uniform color and appearance.
4. Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Patch exterior components in a manner that restores enclosure to a weathertight condition.
6. Where patching occurs on a painted surface, apply primer and intermediate coats over patched area. Apply final coat over entire surface containing patch. Provide additional finish coats over entire surface until patch blends with adjacent surface, at no additional cost to Owner.

D. Clean areas and spaces where cutting andpatching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01731
SECTION 01732 - Selective Demolition

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01322 “Photographic Documentation for Preconstruction Photos.”
2. Section 01500 “Temporary Facilities and Controls.”
3. Section 01524 “Construction Waste Management.”

1.2 Definitions

A. Remove: Detach items from existing construction in their entirety as required for new construction and legally dispose of them off-site.

B. Salvage: Detach items from existing construction and deliver them to Owner.

C. Remove and Reinstall: Detach items from existing construction in their entirety as required for new construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and will remain functional.

E. Abandon: Existing items of construction that are to be disconnected, shutdown and left in place.

1.3 Quality Assurance

A. Provide the services of an experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Provide a Refrigerant Recovery Technician certified by an EPA-approved certification program.

C. Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Comply with all applicable storm water, erosion and air quality regulations.

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

E. Conduct Predemolition meeting at Project site. Review methods and procedures related to selective demolition. Issue meeting minutes.

1.4 Project Conditions

A. Owner will occupy portions of building in and immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
C. Compare existing conditions with Construction Documents before proceeding with selective demolition. Immediately provide written RFI to Architect for resolution of any conflicts found.

D. It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work under a separate contract.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner in writing. Owner will remove hazardous materials under a separate contract.

E. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Re-route utilities if necessary to maintain service, without disruption of service. Maintain fire-protection facilities in service during selective demolition operations.

F. Verify depth and locations of existing utilities to remain prior to start of selective demolition.

1.5 Warranty

A. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - Products (Not Used)

PART 3 - Execution

3.1 Examination

A. Verify that utilities have been disconnected and capped.

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

C. Inventory and record the condition of items to be removed and reinstalled and items to be salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written RFI to Architect immediately.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations. If such condition exists submit written RFI to Architect immediately.

F. Record existing conditions by use of measured drawings, preconstruction photographs and templates. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, assembly, construction, connection and interface with other materials, as needed to make exact reproduction.

G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 Mechanical/Electrical Systems

A. Maintain systems indicated to remain and protect them against damage during selective demolition operations.
B. Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary systems that bypass area of selective demolition and that maintain continuity of systems to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 Preparation

A. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished. Strengthen or add supports when required to adequately support surrounding Work during progress of selective demolition.

3.4 Selective Demolition

A. Demolish and remove existing construction only to the extent indicated and as required by new construction. Use methods required to complete the 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. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. 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. Maintain adequate ventilation when using cutting torches.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly. Remove decayed, infested, corroding or otherwise dangerous unsuitable materials promptly.
6. Remove structural framing members and lower to ground by method suitable to avoid free fall and prevent ground impact and dust generation.

B. Removed and Salvaged Items:

1. Clean and repair items.
2. Pack or crate items. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.
C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Protect construction indicated to remain against damage and soiling during selective demolition.

3.5 Selective Demolition Procedures for Specific Materials

A. Demolish concrete in sections. Cleanly cut concrete full depth at junctures with construction to remain and at regular intervals, then remove concrete between saw cuts.

B. Demolish masonry in small sections. Cleanly cut masonry at junctures with construction to remain, then remove masonry between saw cuts.

C. Saw-cut perimeter of slab on grade areas to be demolished, then break up and remove.

D. Remove resilient floor coverings according to recommendations in RFCI-WP and its Addendum. Remove residual adhesive and prepare substrate for new floor coverings by method recommended in writing by floor finish manufacturer.

E. Remove no more existing roofing than can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

F. Remove air conditioning equipment without releasing refrigerants.

3.6 Disposal of Demolished Materials

A. Remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

B. Do not burn demolished materials.

C. Do not discard or bury demolished materials.

3.7 Cleaning

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 01732
SECTION 01770 - Closeout Procedures

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01290 “Payment Procedures.”
2. Section 01322 “Photographic Documentation.”
3. Section 01781 “Project Record Documents.”
4. Section 01782 “Operation and Maintenance Data.”
5. Section 01820 “Demonstration and Training.”

1.2 Substantial Completion

A. Before requesting review for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected in a punch list format.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover for utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Submit a written request for Project Review for Substantial Completion. On receipt of request, Architect will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after review or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request re-review when incomplete items are corrected.
2. Results of completed review will form the basis of requirements for Final Completion.
1.3 Final Completion

A. Before requesting final review for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment.
2. Submit certified Substantial Completion punch list of items to be completed or corrected stating that each item has been completed or otherwise resolved.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Submit a written request for final review for acceptance. On receipt of request, Architect will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after review or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request re-review when the incomplete items are corrected.

1.4 Warranties

A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, name and address of Contractor.

B. Provide 3 (three) copies of warranties.

PART 2 - Products

2.1 Materials

A. Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

B. Provide close out documents in appropriately sized 3-ring binder with transparent vinyl insert sleeve on both front cover and binding edge. Use multiple binders if necessary.

PART 3 - Execution

3.1 Final Cleaning

A. Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Turn over Project in a “like new” condition.
B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances. Remove and dispose all mock-ups that are not incorporated into Work.

   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

   d. Remove tools, construction equipment, machinery, and surplus material from Project site.

   e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

   f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

   g. Sweep concrete floors broom clean in occupied spaces.

   h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

   i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

   j. Remove labels that are not permanent.

   k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration. Do not paint over name plates, labels, and similar identification items on parts and equipment.

   l. Wipe surfaces of mechanical, electrical, elevator and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

   m. Replace parts subject to unusual operating conditions.

   n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

   o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

   p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

   q. Leave Project clean and ready for occupancy.

C. Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Submit certifications that Project is pest free at time of completion.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

E. Turn over all keys to Owner.

F. Turn over additional materials and products as required by Contract Documents.
SECTION 01781 - Project Record Documents

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01782 “Operation and Maintenance Data.”

1.2 Submittals

A. Submit [one (1)] set of corrected Record Drawings and [one (1)] set of marked-up Record Prints.

B. Submit [one (1)] PDF copy of each Record Drawing whether or not changes and additional information were recorded.

C. Submit [one (1)] PDF copy of Project's Specifications, including addenda and contract modifications.

D. Submit [one (1)] PDF copy of each Product Data submittal.

PART 2 - Products

2.1 Record Drawings

A. Maintain one set of black-line on white record prints of the Contract Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown on the current Contract Documents.

   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

   b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable, colored pencil. Use colors to distinguish between changes for different categories of the Work at same location. Establish legend to clearly define colors.

3. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Scan each Record Drawing whether it contains marks or not and create a PDF of each drawing.

3. Provide the following identification on each Record Drawing:

   a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Contractor.

2.2 Record Specifications

A. Mark Specifications to indicate the actual product or method of installation that varies from that indicated in Contract Documents, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders.

2.3 Record Product Data

A. Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications and Record Drawings where applicable.

2.4 Miscellaneous Record Submittals

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1. RFI's and RFI Log.
2. FCD's and FCD Log.
3. Change Orders.

PART 3 - EXECUTION

3.1 Recording and Maintenance

A. Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 01781
SECTION 01782 - Operation and Maintenance Data

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:

1. Section 01770 “Closeout Procedures.”

1.2 Submittals

A. Submit [three (3)] copies of each Operation and Maintenance Manual in final form at least [fifteen (15)] days before Substantial Completion. Architect will return copy with comments. Correct or modify each manual to comply with Architect’s comments. Submit [three (3)] copies of each corrected manual prior to date of Substantial Completion.

1.3 Coordination

A. Where Operation and Maintenance documentation includes information on installations by more than one factory authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - Products

2.1 Manuals, General

A. Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.

B. Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. List each product included in manual in a Table of Contents, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual. If manual requires multiple binders provide master table of contents in each binder and clearly identify each binder with a sequential number.

D. Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Provide heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11 inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
   a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets. Indicate total number of volumes. Provide a Master List of all manuals showing number and Title.

2. Provide heavy-paper dividers with tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Provide transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations. Key drawings for reference by labeling envelopes.

2.2 Emergency Manuals

A. Organize manual into a separate section for type of emergency, emergency instructions, and emergency procedures.
B. For each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire
   2. Flood
   3. Gas Leak
   4. Water Leak
   5. Power Failure
   6. Water Outage
   7. Equipment Failure
   8. Chemical Release or Spill

C. Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
D. Include stopping, shutdown instructions for each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

2.3 Operation Manuals

A. Provide operation data, equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements. Organize into a binder by system, subsystem and equipment.
B. Include the following:
1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.

D. Describe the sequence of operation, and diagram controls as installed.

E. Diagram piping as installed, and identify color-coding where required for identification.

2.4 Product Maintenance Manual

A. Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer and supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
5. Reordering information for specially manufactured products.

D. Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

E. Include lists of materials and local sources of materials and related services.

F. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 Systems And Equipment Maintenance Manual

A. For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. List each system, subsystem, and piece of equipment included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number
C. Provide manufacturers’ maintenance documentation including maintenance instructions, drawings and diagrams for maintenance identification, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment.

D. Include test and inspection instructions, troubleshooting guide, disassembly instructions, adjusting instructions and demonstration and training DVD, if available, that detail essential maintenance procedures.

E. Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers’ maintenance documentation and local sources of maintenance materials and related services.

G. Include copies of maintenance agreements with name and telephone number of service agent.

H. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds, including procedures to follow and required notifications for warranty claims.

PART 3 - Execution

3.1 Manual Preparation

A. Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data includes more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable. Assemble a complete set of emergency information for Owner’s operating personnel.

B. Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation. Do not use Contract Documents or Record Documents as part of operation and maintenance manuals.

END OF SECTION 01782
SECTION 01820 - Demonstration and Training

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Sections include:
   1. Section 01310 “Project Management and Coordination.”

1.2 Submittals

A. Submit instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors’ names for each training module. Include learning objective and outline for each training module.

B. Submit Demonstration and Training Videotapes within 7 (seven) days of end of each training module.

1.3 Quality Assurance

A. Provide a firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Provide a factory-authorized service representative, complying with requirements in Section 01400 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Conduct pre-training meeting at Project site. Review methods and procedures related to demonstration and training.

D. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 Instruction Program

A. Develop an instruction program that includes individual training modules for each system and equipment item.

B. Develop learning objectives and teaching outlines for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:

   2. Documentation.
   3. Emergencies.
5. Adjustments.
6. Troubleshooting.
7. Maintenance.
8. Repairs.

PART 3 - Execution

3.1 Instruction

A. Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

C. Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with Owner with at least 7 (seven) days' advance notice.

D. At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

3.2 Demonstration and Training Videotapes

A. Record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Provide high-quality video in DVD format.

C. Describe scenes on video by audio narration by microphone while video is recorded. Include description of items being viewed. Describe vantage point, indicating location, direction and elevation or story of construction.

END OF SECTION 01820
SECTION 02742 – Pavement Marking

PART 1 - General

1.1 Related Documents
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 Submittals
   A. Product Data: For each type of product indicated.

1.3 Quality Assurance
   A. Preinstallation Meeting: Conduct meeting at Project site.
   B. Comply with referenced Building Code for requirements for truncated domes.

1.4 Project Conditions
   A. Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40°F for oil-based materials and 55°F for water-based materials, and not exceeding 95°F.

PART 2 - Products

2.1 Pavement Marking Materials
   A. Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint or approved equal. Provide colors indicated.

2.2 Truncated Domes
   A. Provide surface applied Safety Step TD Truncated Domes by Safety Step TD or approved equal. Provide truncated dome material with tapered edge on all perimeter edges. Provide manufacturer’s recommended exterior grade adhesive, formulated for each type of substrate material encountered.
   B. Truncated dome products must comply with referenced edition of Building Code.

PART 3 - Execution

3.1 Examination
   A. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 Pavement Marking
   A. Do not apply pavement-marking paint until layout, colors, and placement have been verified.
   B. Sweep and clean surface to eliminate loose material and dust. Provide surface satisfactory to paint manufacturer and to satisfy warranty requirements.
C. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Striping shall be 4” wide minimum. Uno. Apply at manufacturer’s written recommended rates to provide a minimum wet film thickness of 15 mils. Apply marking paint in two coats.

3.3 Truncated Domes

A. Install truncated domes per manufacturer’s written recommendations to lines and extents indicated.

END OF SECTION 02742
SECTION 02875 - Post and Panel Signage

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03300 "Cast-in-Place Concrete."
   2. Section 10431 "Signage."

1.2 Performance Requirements

A. Provide post and panel signs capable of withstanding the effects of gravity loads and wind loads indicated on drawings.

1.3 Submittals

A. Product Data: For each type of product indicated.

B. Sign Schedule: Use same designations indicated on Drawings.

1.4 Quality Assurance

A. Obtain each sign type indicated from one source from a single manufacturer.

B. Comply with the current edition of the “Americans with Disabilities Act (ADA) and California Title 24 Accessibility Regulations.

1.5 Project Conditions

A. Proceed with installation only when existing and forecasted weather conditions permit installation of signs to be performed according to manufacturers' written instructions and warranty requirements.

1.6 Coordination

A. Coordinate installation of anchorages and furnish setting drawings, templates, and directions for installing anchorages and other items that are to be embedded in concrete.

PART 2 - Products

2.1 Materials

A. Aluminum Sheet: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32. Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner. Provide 0.125 inch thick panel with predrilled holes for mounting sign to post.
B. Reflectorized Sign Film: 3M DG reflective sheeting Series 4000 or approved equal.

C. Fabricate posts to lengths indicated. Provide reverse sleeve method with inserts recommended by manufacturer, sized for close fit inside posts. Size inserts for direct embedment in concrete foundations and to attach sign posts securely and prevent sign from overturning when subjected to normal loading conditions prevailing at Project site. Drill posts and inserts for through bolts for fastening them together. Provide bolts for fastening posts to inserts. Fabricate from 0.120-inch thick, square galvanized steel tubing. Include post caps and related accessories required for complete installation. Hot-dip galvanize post assemblies after fabrication to comply with ASTM A 123.

2.2 Accessories

A. Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance.

PART 3 - Execution

3.1 Examination

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

A. Excavate for sign foundation to elevations and dimensions indicated. Reconstruct subgrade that is not firm, undisturbed, or compacted soil, or that is damaged by freezing temperatures, rain, accumulated water, or construction activities by excavating a further 12 inches, backfilling with satisfactory soil, and compacting to original subgrade elevation.

B. Set reverse sleeves required for installation of signs. Protect portion of sleeve above ground from concrete splatter.

C. Locate signs and accessories where indicated. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance. Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to post.

3.3 Cleaning and Protection

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 02875
SECTION 03300 - Cast-In-Place Concrete

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 Submittals

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mixing water, if any, to be withheld for later addition at Project site.

C. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Steel reinforcement and accessories.

D. Field quality-control test and inspection reports.

E. Minutes of preinstallation conference.

1.3 Quality Assurance

A. Provide a qualified installer who employs on Project personnel qualified as ACI-certified.

B. Provide a manufacturer experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment. Manufacturer must also be certified according to NRMCA’s “Certification of Ready Mixed Concrete Production Facilities.”

C. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

D. Qualify welding procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specification for Structural Concrete," Sections 1 through 7, for structural, lightweight and architectural concrete.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Prior to submittal of mix design and start of concrete operations, conduct preinstallation conference at Project site.
1. Review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including independent testing agency responsible for concrete design mixtures, ready-mix concrete manufacturer and finish floor installer.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurements, concrete repair procedures, and concrete protection.

1.4 Delivery, Storage, And Handling

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

C. Deliver, store and handle form liners to prevent deformation, cracking and other damage detrimental to function of form liner.

PART 2 - Products

2.1 Form-Facing Materials

A. Provide formwork per ACI 347 and ACI 301.

B. Rough-Formed Finished Concrete: Plywood APA form V-354, PS 1-95, Group I, exterior BB plyform, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit, conforming to WWPA No. 1 or better. Form columns using spiral fiber tubes.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, ¾ by ¾ inch, minimum.

D. Form-Release Agent: Commercially formulated form-release agent free of oil, silicone, wax and non-drying materials that will not bond with, stain, or adversely affect concrete surfaces and is compatible with and will not impair subsequent finishes and treatments of concrete surfaces. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2.2 Steel Reinforcement

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

2.3 Reinforcement Accessories

A. Welding Electrodes: AWS D5.1, 80 of 90 series, low hydrogen type AWS D1.4.

B. Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place per ACI 315. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 Concrete Materials

A. Portland Cement: ASTM C 150, Type II or V, [gray] [white].

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B. Silica Fume: ASTM C 1240, amorphous silica.


D. Water: ASTM C 94 and potable.

2.5 Curing Materials

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film, non-staining, 10 mil thickness.

B. Water: Potable.

2.6 Related Materials

A. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces.

B. Anchor Adhesive: Subject to requirements provide the following or approved equal: Hilti HY150 Epoxy Tie Adhesive.

2.7 Concrete Mixtures, General

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

C. Use admixtures according to manufacturer's written instructions.

D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup and consistent color from batch to batch.

2.8 Fabricating Reinforcement

A. Fabricate steel reinforcement according to CRSI’s “Manual of Standard Practice.”

2.9 Concrete Mixing

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information. Limit time from batch plant to placement to 90 minutes maximum.

PART 3 - Execution

3.1 Formwork

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Limit deflection of form-facing panels to not exceed ACI 303.1 requirements.
C. In addition to limits on form-facing panel deflection, limit cast-in-place architectural concrete surface irregularities, designated by ACI 347R as abrupt or gradual, Class A, 1/8 inch.

D. Fabricate forms to result in cast-in-place concrete that complies with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

E. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated.

F. Construct forms tight enough to prevent loss of concrete mortar.

G. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.
   3. Seal form joints and penetrations at form ties with form joint tape or form joint sealant to prevent cement paste leakage.

H. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

I. Chamfer exterior corners and edges of permanently exposed concrete.

J. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

K. Clean forms and adjacent surfaces to receive concrete. Remove ships, wood, sawdust, dirt, and other debris just before placing concrete.

L. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

M. Coat contact surfaces of forms and chamfer strips with form-release agent, according to manufacturer’s written instructions, before placing reinforcement.

3.2 Embedded Items

A. Place and secure anchorage devices, sleeves, block outs and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete including Work of other trades. Use setting drawings, templates, diagrams, instructions, to coordinate and locate items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. Install reglets to receive waterproofing and flashings in outer face of concrete.
   3. Install dovetail anchor slots in concrete structures as indicated.

B. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
3.3 Steel Reinforcement

A. Comply with CRSI's "Manual of Standard Practice" for placing reinforcement. Do not cut or puncture vapor retarder. Repair damage with manufacturer’s recommended tape and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars. Weld reinforcing bars according to AWS D1.4, where indicated. Perform welding of reinforcing under supervision of welding inspector.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.4 Concrete Placement

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. Deposit concrete to avoid segregation. Deposit concrete continuously between construction joints.

   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate. Do not permit vibrators to contact forms, form ties or reinforcing.

3.5 Finishing Formed Surfaces

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
3.6 **Miscellaneous Concrete Items**

A. Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.7 **Concrete Protecting And Curing**

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Control evaporation from unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb. /sq. ft. before and during finishing operations.

C. Cure formed concrete surfaces, including underside of beams, supported slabs, columns and other similar surfaces. Begin curing unformed surfaces immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces. Cure concrete according to ACI 308.1, by one or a combination of the following methods that will not mottle, discolor or stain concrete:

1. **Moisture-Retaining-Cover Curing:** Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.8 **Field Quality Control**

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. **Testing Frequency:** Obtain one composite sample for pour.
2. **Slump:** ASTM C 143; one test at point of placement.
3. **Compression Test Specimens:** ASTM C 31. Cast and field cure 2 (two) sets of two standard cylinder specimens for each composite sample.
4. **Compressive-Strength Tests:** ASTM C 39; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

5. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

6. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

7. Test results shall be reported in writing to Architect, concrete manufacturer, Contractor and Inspector within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

8. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 (forty-eight) hours of finishing.

E. Remove and replace concrete that cannot be repaired and cured to Architect’s approval.

F. Protect corners, edges, and surfaces of concrete from damage; use guards and barricades.

G. Protect concrete from staining, laitance, and contamination during remainder of construction period.

H. Clean concrete surfaces after finish treatment to remove stains, markings, dust, and debris.

I. Wash and rinse surfaces according to concrete finish applicator’s written recommendations. Protect other Work from staining or damage due to cleaning operations. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

End of Section 03300
SECTION 06402 - Interior Architectural Woodwork

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 Submittals

A. Samples for Verification:
   1. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish applied to core material and specified edge material applied to 1 edge.
   2. Solid-surfacing materials, 6 inches square.

1.3 Quality Assurance

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a licensee of WI’s Certified Compliance Program.

B. Installer Qualifications: Fabricator of products.

C. Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers and wood doors with face veneers that are sequence matched with woodwork and transparent-finished wood doors that are required to be of same species as woodwork.

D. Comply with WI's "Manual of Millwork" for indicated architectural woodwork. Provide WI-certified compliance certificates indicating that interior architectural woodwork, including installation, complies with requirements of grades specified.

E. Provide interior architectural woodwork produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria."

F. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Conduct preinstallation conference at Project site.

1.4 Delivery, Storage, And Handling

A. Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
1.5 **Coordination**

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

B. Where architectural woodwork is intended to match species, finish and color of wood doors. Coordinate with woodwork fabricator and door supplier to assure matching appearance.

**PART 2 - Products**

2.1 **Materials**

A. Provide materials that comply with requirements of WI’s quality standard for each type of woodwork and quality grade specified.

B. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard. Match existing laminate texture, thickness, color and quality.

1. Subject to requirements, provide high-pressure decorative laminates by one of, or equal to, the following:
   
   a. Arborite; Division of ITW Canada, Inc.
   b. Formica Corporation.
   c. Nevamar Company, LLC; Decorative Products Div.
   d. Wilsonart International; Div. of Premark International, Inc.

2.2 **Miscellaneous Materials**

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Select material, type, size, and finish of anchors required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

C. Do not use adhesives that contain urea formaldehyde.

D. Use adhesives that comply with required VOC Limits.

E. Provide unpigmented contact cement for bonding plastic laminate surfaces, faces and edges.

2.3 **Fabrication**

A. Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.

B. Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
2.4 Plastic-Laminate Countertops

A. Grade: Match existing.
B. High-Pressure Decorative Laminate Grade: Match existing.
C. Provide materials and products that result in colors and textures of exposed laminate surfaces as selected by Architect from manufacturer’s full range of colors, patterns, and textures.
D. Grain Direction: Match existing.
E. Edge Treatment: Match existing.
F. Core Material: Match existing.
G. Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.

PART 3 - Execution

3.1 Preparation

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 Installation

A. Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96-inches. Shim as required with concealed shims.
D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
E. Anchor woodwork to anchors or blocking built in or directly attached to suitable supporting substrates. Secure with concealed fasteners whenever possible and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
F. Touch up finishing work specified in this Section after installation of woodwork.

3.3 Adjusting And Cleaning

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
B. Clean, lubricate, and adjust hardware.
C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06402
SECTION 07552 - SBS-Modified Bituminous Membrane Roofing

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Section 05310 "Steel Deck."
2. Section 07210 "Building Insulation."
3. Section 07271 “Building Underlayments.”
4. Section 07620 “Sheet Metal Flashing and Trim.”
5. Section 07720 “Roof Accessories.”
6. Division 15 “Plumbing” and “Mechanical” Sections.

C. References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout these specifications.

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<tr>
<td>USBGC</td>
<td>United States Green Building Council, Washington, D.C.</td>
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1.2 System Description

A. Roofing Assembly 1:

1. Specification Number: 2030-IT.
2. Slope: Less than 1/8 inch.
3. Project Type: Tear off.
5. Substrate: Existing lightweight insulating concrete.
6. **Roof System**: Torch grade SBS modified bitumen base ply, torch applied; torch grade SBS modified bitumen finish ply, torch applied.
7. **Flashing System**: Metal foil surfaced SBS modified bitumen flashing ply, torch applied.

### 1.3 Submittals

**A. Letters:**

1. Letter from primary roofing manufacturer confirming that the installer is an acceptable contractor authorized to install the proposed system.
2. Letter from primary roofing manufacturer stating that the proposed application will comply with the manufacturer’s requirements in order to qualify the project for the specified guarantee.

**B. Product Data:** For each type of product indicated.

**C. Samples for the following products:**

1. 12-by-12-inch square of base sheet material.
2. 12-by-12-inch roofing membrane sheet.
3. 12-by-12-inch square of mineral-granule-surfaced roofing membrane cap sheet, of color specified.
4. 12-by-12-inch square of roof insulation.
5. 12-by-12-inch square of walkway pad.
6. Six insulation fasteners of each type, length, and finish.
7. 12-by-12-inch base flashing material.
8. 12-by-12-inch square roof board.

**D. Research/Evaluation Reports:** For components of roofing system.

**E. Warranties:** Warranties specified in this Section.

**F. Submittals Prior to Project Close-out:**

1. Manufacturer’s printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.
2. Certificate of Analysis from the testing laboratory of the primary roofing materials manufacturer, confirming the physical and mechanical properties of the roofing membrane components. Testing shall be in accordance with the parameters published in ASTM D 5147 and ASTM D 6298 and indicate Quality Assurance/Quality Control data as required to meet the specified properties. A separate Certificate of Analysis for each production run of material shall indicate the following information:
   a. Material type.
   b. Lot number.
   c. Production date.
   d. Dimensions and Mass (indicate the lowest values recorded during the production run);
      1) Roll length.
      2) Roll width.
      3) Selvage width.
      4) Total thickness.
      5) Thickness at selvage (coating thickness).
      6) Weight.
e. Physical and Mechanical Properties;

1) Low temperature flexibility.
2) Maximum load.
3) Elongation @ 5% maximum load (ultimate elongation).
4) Dimensional stability.
5) Granule embedment.
6) Resistance to thermal shock (foil faced products).

3. Manufacturer’s printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

1.4 No Substitutions

A. Per Public Contract Code 3400 the District has standardized their roofing systems and no substitutions will be accepted.

1.5 Quality Assurance

A. Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.

B. Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third party auditor under the ISO 9001:2000 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.

C. The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.

1. Underwriters Laboratories Class A acceptance of the proposed roofing system (including mopping asphalt or cold adhesive) without additional requirements for gravel or coatings.
2. Factory Mutual Approval Standard 4470 listing for the proposed membrane system. The roof membrane configuration shall be approved by FM for Class 10-SH (severe hail) exposure. The roof configuration (including fastening of base sheet or insulation) shall be approved by FM for minimum 1-90 windstorm construction.
3. The roof membrane system shall meet the approval requirements of the U.S. EPA Energy Star program and the State of California Title 24 Part 6 requirements.

D. Installer shall have a minimum of 3 years experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

E. The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of accepted Roofing Knowledge (HARK) as published by the National Roofing Contractor’s Association, amended to include the acceptance of a phased roof system installation.
F. Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

G. Ensure that the primary roofing materials manufacturer provided direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

H. Obtain components for roofing system from a single roofing system manufacturer.

I. Pre-installation Roofing Meeting: Before starting roof deck construction, conduct meeting at Project site. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner’s insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer’s representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer’s written instructions. Review required submittals.
3. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review Construction Document requirements including specifications, base flashings details, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation, inspection, testing, and repair procedures after roofing installation.
10. Review forecasted weather conditions and procedures and limitations for unfavorable weather.
11. Record discussion and issue meeting minutes to all interested parties including Owner, Architect and Inspector.
12. The intent of the meeting is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved to the satisfaction of the Owner, Architect of Record and Roofing Manufacturer. This shall not be construed as interference with the progress of the work on the part of the Owner or Architect of Record, and such resolution shall not be justification for added time or money to base Contract.


K. When the project is in progress, the roofing system manufacturer will provide the following:

1. Report progress and quality of the work as observed.
2. Provide periodic job site inspections.
3. Report to the Architect and Owner in writing, any failure or refusal of the contractor to correct unacceptable practices called to the contractor’s attention.
4. Confirm after completion that manufacturer has observed not application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.6 Product Delivery Storage and Handling
A. Deliver materials in the manufacturer’s original sealed and labeled containers and in quantities required to allow continuity of application with manufacturer’s name, product brand name and type, date of manufacture, shelf life expiration date, and directions for storage.

B. Store materials out of direct exposure to the elements and UV exposure. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives and asphalt cutback products away from open flames, sparks or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable. Legally dispose of materials that cannot be applied within its stated shelf-life.

C. Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.

D. Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed and replaced at the contractor’s expense.

E. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

F. Do not expose materials subject to water or solar damage in quantities greater than can be weatherproofed during same day.

G. Provide a qualified manufacturer that has FMG APPROVAL for roofing system identical to that used for this Project.

H. Obtain components for roofing system from a single roofing system manufacturer.

1.7 Project/Site Conditions

A. Requirements prior to job start:
1. Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
2. Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
3. Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

B. Environmental requirements:
1. Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination. Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer’s written instructions and warranty requirements.

C. Protection requirements:
1. Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
2. Crew members handling torches shall be trained by an Authorized Certified Roofing Torch Applicator (CERTA) Trainer, be certified according to CERTA torch safety guidelines as
published by the National Roofing Contractor’s Association (NRCA), and follow torch safety practices as required by the contractor’s insurance carrier. Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas during roof construction activity, and for the minimum period required by CERTA guidelines after roofing material application has been suspended for the day.

3. Prevent access by the public to materials, tools and equipment during the course of the project.
4. Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
5. Complete, to the Owner’s satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.

D. Test cementitious substrates for moisture content and provide written acceptance of moisture content on roofing manufacturer’s letterhead and meets warranty requirements. Do not install roofing on a damp or wet deck.

1.8 Performance Requirements

A. Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Provide roofing materials that are compatible with one another and compatible with substrates under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

1.9 Warranty

A. Roof Membrane/System Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer’s 20 year labor and materials guarantee covering the rigid insulation, insulation fasteners/plates, and roof membrane/flashing system. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

PART 2 - Products

2.1 Roofing System Assembly/Products

A. Base Sheet:

1. A fiberglass reinforced, asphalt coated sheet with a polyolefin film backing, having a minimum weight of 20 lb/sq. The sheet shall conform to ASTM D 4601, Type II requirements:
   
   a. Siplast, Inc., Parabase FS.

2.2 Description of Systems

A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend and coated one side with a torch grade SBS bitumen blend adhesive layer. The adhesive layer shall be manufactured using a process that embosses the surface with a grooved pattern to provide optimum burn-off of the plastic film and to maximize application rates. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14° F. Passing results shall show no signs of membrane cracking or interplay delamination after 500
cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

1. **Siplast Paradiene 20TG/30 CR FR TG torchable roof system.**
   2. **Modified Bitumen Base and Stripping Ply: Siplast Paradiene 20 – torchable grade.**
      b. Thickness (min): 110 mils ASTM D 5147.
      c. Weight (min per 100 ft² of coverage): 76 lb.
      d. Maximum filler content in elastomeric blend: 35% by weight.
      e. Low temperature flexibility @ -15° F: PASS ASTM D 5147.
      f. Peak Load (avg) @ 73° F: 30 lbf/inch ASTM D 5147.
      g. Peak Load (avg) @ 0° F: 75 lbf/inch ASTM D 5147.
      h. Ultimate Elongation (avg) @ 73° F: 50% ASTM D 5147.
      i. Dimensional Stability (max): 0.1% ASTM D 5147.
      k. Approvals: UL Class listed, FM Approved (product shall bear seals of approval).
      l. Reinforcement: Fiberglass mat or other meeting the performance and dimensional stability criteria.

3. **Modified Bitumen Finish Ply: Siplast Paradiene 30 CR FR - torchable grade.**
   c. Thickness at selvage (coating thickness) min: 94 mils ASTM D 5147.
   d. Weight (min per 100 ft² of coverage): 75 lb.
   e. Maximum filler content in elastomeric blend: 35% by weight.
   f. Low temperature flexibility @ -15° F: PASS ASTM D 5147.
   g. Peak Load (avg) @ 73° F: 30 lbf/inch ASTM D 5147.
   h. Peak Load (avg) @ 0° F: 75 lbf/inch ASTM D 5147.
   i. Elongation @ 5% Maximum Load (avg) @ 73° F: 55% ASTM D 5147.
   j. Dimensional Stability (max): 0.1% ASTM D 5147.
   l. Solar Reflectance: = 0.70% ASTM D 1549.
   m. Thermal Emittance: = 0.80% ASTM D 1371.
   n. Approvals: UL Class listed, FM Approved (product shall bear seals of approval).
   o. Reinforcement: Fiberglass mat or other meeting the performance and dimensional stability criteria.

B. **Flashing Membrane Assembly:** A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements:

1. **Cant Backing Sheet and Flashing Reinforcing Ply: Siplast Paradiene 20 SA.**
   b. Thickness (min): 98 mils ASTM D 5147.
   c. Weight (min per 100 ft² of coverage): 72 lb.
   d. Maximum filler content in elastomeric blend: 35% by weight.
   e. Low temperature flexibility @ -15° F: PASS ASTM D 5147.
f. Peak Load (avg) @ 73° F: 30 lbf/inch ASTM D 5147.
g. Peak Load (avg) @ 0° F: 75 lbf/inch ASTM D 5147.
h. Ultimate Elongation (avg) @ 73° F: 50% ASTM D 5147.
i. Dimensional Stability (max): 0.1% ASTM D 5147.
I. Approvals: UL Class listed, FM Approved (product shall bear seals of approval).
m. Reinforcement: Fiberglass mat or other meeting the performance and dimensional stability criteria.

   b. Thickness (min): 138 mils ASTM D 5147.
   c. Weight (min per 100 ft² of coverage): 92 lb.
   d. Coating Thickness – back surface (min): 40 mils ASTM D 5147.
   e. Maximum filler content in elastomeric blend: 35% by weight.
   f. Low temperature flexibility @ -0° F: PASS ASTM D 5147.
   g. Peak Load (avg) @ 73° F: 85 lbf/inch ASTM D 5147.
   h. Peak Load (avg) @ 0° F: 180 lbf/inch ASTM D 5147.
   i. Ultimate Elongation (avg) @ 73° F: 45% ASTM D 5147.
   j. Tear-Strength (avg): 120 lbf ASTM D 5147.
   k. Dimensional Stability (max): 0.2% ASTM D 5147.
   m. Cyclic Thermal Shock Stability (maximum): 0.2% ASTM D 6298.
   n. Approvals: UL Class listed, FM Approved (product shall bear seals of approval).
o. Reinforcement: Fiberglass mat or other meeting the performance and dimensional stability criteria.
p. Surfacing: Aluminum metal foil.

C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

1. Parapro 123 Flashing System by Siplast.

2.3 Roofing Accessories

A. Bituminous Cutback Materials

1. Primer: An asphalt/solvent blend meeting ASTM D 41, South Coast Air Quality District and Ozone Transport Commission requirements. Siplast PA-917 LS Primer by Siplast.
2. Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D 4586 Type II requirements. Siplast PA-1021 Plastic Cement.

B. Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows: Siplast PA-1021 Plastic Cement.

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C. Synthetic Chips: Synthetic chips to match the factory applied reflective surfacing of the finish ply. Siplast CR 11 Synthetic Chips.

D. Perlite Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The face of the cant shall have a nominal 4 inch dimension.

E. Fasteners

1. Insulation Fasteners: Insulation fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The insulation fasteners shall provide attachment required to meet the specified uplift performance and to restrain the insulation panels against the potential or ridging. The fastening pattern for each insulation panel to be used shall be as recommended by the insulation manufacturer and approved by the manufacturer of the primary roofing products. Acceptable insulation fastener manufacturers for specific deck types are listed below.

   a. A fluorocarbon coated screw type roofing fastener having a minimum 0.220 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.

   b. Siplast HD Fastener with Parafast 3” Metal Plate by Siplast, Irving, TX.

F. Plumbing stacks should be 4 lb. sheet lead formed and rolled.

2.4 Roof Insulation

A. Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate: ASTM C 1289, Type II, Class I, Grade 2, R value of 6 for 1” thickness minimum density, square edged. Subject to requirements, provide products by one of, or equal to the following: Siplast, Inc. or approved equal.

C. Provide saddles, crickets, tapered edge strips, cants, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

PART 3 - Execution

3.1 Examination

A. Examine substrates and conditions, with roofing manufacturer, installer, and waterproofing consultant present, for compliance with the following requirements and other conditions affecting performance of roofing system. Provide written statement on roofing manufacturer’s letterhead that substrate is acceptable and meets warranty requirements.

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place. Do not allow pipes and conduits to be closely grouped or bundled.

2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05310 "Steel Deck."

4. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
5. Verify that concrete substrate is visibly dry and free of moisture. Test for moisture; confirm that moisture content of deck does not exceed manufacturer’s written recommended limits.

6. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

7. Verify that deck surfaces and project conditions are ready to receive work of this Section.

8. Verify that deck is clean and smooth, free of depressions, projections or ripples, and is properly sloped to drains, valleys, or eaves.

9. Verify that adjacent roof substrate components do not vary more than ¼ inch in height.

10. Verify that deck surfaces are dry and free of snow or ice. Verify that metal deck flutes are clean and dry.

11. Test concrete deck to verify that pH levels are within roofing manufacturer’s written recommended limits.

12. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

13. Protect other work from spillage of roofing materials and prevent material from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the SBS-Modified bituminous roofing system.

14. Proceed with installation only after unsatisfactory conditions have been corrected.

15. Proceeding with installation of insulation board, roofing board, primers, roofing membrane or flashings constitutes acceptance of substrate and that substrate will satisfy roofing manufacturer’s warranty requirements.

3.2 Preparation

A. Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

B. Remove remaining components of existing roofing system.

1. Surface gravel.
2. Roof membrane.
4. Edge metal.
5. Flanged metal flashings.
6. Cants.
7. Walkways.
10. Metal trim, counterflashing.

C. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer’s written instructions. Remove sharp projections.

D. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

E. Fill honeycombing and imperfections in concrete deck. Remove fins and other protrusions.

F. Coordinate installation of roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight.

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G. Seal all curb, wall and parapet flashing open edges. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

3.3 Base Sheet Application

A. Base Sheet Application to Prepared Substrate (Assembly 1): Lay the base sheet dry over the entire area to be roofed, lapping sides and ends a maximum of 1 inch.

3.4 Roof Membrane Installation

A. Apply roofing in accordance with roofing system manufacturer’s instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.

B. An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials including synthetic chips, and exercise care in ensuring that the finished application is acceptable to Owner.

C. Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.

D. Cutting or alterations of bitumen, primer, and sealants will not be permitted.

E. Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.

1. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.

2. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.

3. Maximum sheet lengths and special fastening of the specified roof membrane system may be required at various slope increments where the roof deck slope exceeds ½ inch per foot. The manufacturer shall provide acceptable sheet lengths and the required fastening schedule for all roofing sheet applications to applicable roof slopes.

F. Broadcast synthetic chips over bitumen/adhesive overruns on the finish ply surface.

G. Cut the cant backing sheet into 12 inch widths and peel the release film from the back of the sheet. Set the sheet into place over the primed substrate extending 6 inches onto the field of the roof area and 6 inches up the vertical surface utilizing minimum 3 inch laps. Set the non-combustible cant into place dry prior to installation of the roof membrane base ply. Flash walls and curbs using the reinforcing sheet and the metal foil flashing membrane. After the base ply has been applied to the top of the cant, prime the base ply surfaces to receive the reinforcing sheet. Fully adhere the reinforcing sheet, utilizing minimum 3 inch side laps onto the primed base ply surface and up the primed wall or curb to the desired flashing height. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot...
widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil
flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches
beyond the toe of the cant onto the prepared surface of the finished roof and up the wall or curb to the
desired flashing height. Exert pressure on the flashing sheet during application to ensure complete
contact with the vertical/horizontal surfaces, preventing air pockets; this can be accomplished by using a
damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9
inch centers. (See manufacturer’s schematic for visual interpretation.)

H. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in
accordance with the membrane system manufacturer’s printed installer’s guidelines and other applicable
written recommendations as provided by the manufacturer.

I. At end of day’s work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-
offs can be build using asphalt or plastic cement and roofing felts, constructed to withstand protracted
periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

3.5 Roof System Interface with Related Components

A. Edge Metal: Completely prime metal flanges and allow to dry prior to installation. Turn the base ply
down 2 inches past the roof edge and over the nailer. After the base ply and continuous cleat (if
applicable) have been installed, set the flange in mastic and stagger nail every 3 inches on center. Strip-in
the flange using the stripping-ply material, extending a minimum of 4 inches beyond the edge of the
flange. Terminate the finish ply at the gravel-stop rise of the edge metal. SEE ITEM: SEALANT, for
finish of this detail.

B. Lead Pipe Flashings: Completely prime the lead flanges and allow to dry prior to installation. After the
base ply has been applied, set the flange in mastic and strip-in the flange using the stripping-ply material,
extending a minimum of 4 inches beyond the edge of the flange. Terminate the finish ply at the flange-
sleeve juncture of the pipe flashing. SEE ITEM: SEALANT, for finish of this detail.

C. Small Pipe Supports: Support all gas lines and conduits which are a maximum of 1 inch diameter and run
horizontally over the roof membrane surface using wood blocking and the manufacturer’s walkway pad –
roof protection material. The blocking shall be 4 inches by 4 inches by 12 inches in size. Cut each
walkway pad to a size which extends a minimum of 2 inches beyond the perimeter of the blocking.
Loosely secure the pipe to allow movement over the 6 inch center of each block; the spacing for the
blocks shall be of adequate distance to prevent sagging of the pipe and to prevent the pipe from coming
into contact with the new roof assembly. Set the walkway pad dry over the new roof assembly. Set each
pipe support block dry over the walkway pad.

D. Metal Pipe Flashings: Completely prime the metal pipe flanges and allow to dry prior to installation.
After the base ply has been applied, set the flanges in mastic and strip-in the flange using the stripping-
ply material, extending a minimum of 4 inches beyond the edge of the flange. Terminate the finish ply at
the flange-sleeve juncture of the pipe flashing. Install a watertight umbrella to the penetration,
completely covering the opening of the pipe flashing. SEE ITEM: SEALANT, for finish of this detail.

E. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge
transition to metal flashings incorporated into the roof system.

3.6 Field Quality Control and Inspections

A. Leave all areas around job site free of debris, roofing materials, equipment and related items after
completion of job.
B. Notify the manufacturer by means of manufacturer’s printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-installation meeting. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer’s representative. Complete, sign, and mail the punch list form to the manufacturer’s headquarters.

D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements. Owner reserves the right to test roofing and flashing system for compliance with requirements. If testing confirms non-compliance cost of testing and inspection is contractor’s responsibility.

E. Additional testing and inspecting, at contractor’s expense, may be performed to determine compliance of replaced or additional work with specified requirements.

F. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer’s final endorsement for issuance of the specified guarantee.

3.7 Protecting and Cleaning

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

D. Remove roofing and flashing drippings from all walls, windows, floors, ladders and finished surfaces.

E. In areas where finished surfaces are soiled by roofing work or any other sources of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.

3.8 Instructions to Owner

A. At a time and date agreed to by the Owner, instruct the Owner’s facility manager, or other representative designated by the Owner, on the following procedures:

1. Roofing troubleshooting procedures.
2. Notification procedures for reporting leaks or other apparent roofing problems.
3. Roofing maintenance.
4. The Owner’s obligations for maintaining the roofing warrant in effect and force.
5. The manufacturer’s obligations for maintaining the roofing warranty in effect and force.

End of Section 07552
SECTION 07620 - Sheet Metal Flashing and Trim

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Section 03300 “Cast-in-Place Concrete.”
2. Section 06402 “Interior Architectural Woodwork.”
3. Section 07552 “SBS-Modified Bituminous Membrane Roofing.”
4. Section 09900 “Painting.”

1.2 Performance Requirements

A. Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Fabricate and install roof edge flashing and copings capable of resisting wind zone 3 velocity pressures of 46 to 104 lbf/sq. ft., 208-lbf/sq. ft. perimeter uplift force, 312-lbf/sq. ft. corner uplift force, and 104-lbf/sq. ft. outward force according to recommendations in FMG Loss Prevention Data Sheet 1-49.

C. Provide sheet metal flashing and trim that allow for thermal movements resulting from the maximum change (range) in ambient and surface temperatures of 120° F, ambient; 180° F, material surfaces to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

D. Provide sheet metal flashing and trim that do not allow water infiltration to building interior concealed spaces, unoccupied spaces or cavities.

1.3 Submittals

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:

1. Identify material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
4. Details of expansion-joint covers, including showing direction of expansion and contraction.

C. Samples: For each type of metal and exposed finish required, prepared on samples of size indicated below:
1. Sheet Metal Flashing: 12 inches long in shapes, bends and folds indicated. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim: 12 inches long. Include fasteners and other exposed accessories.

1.4 Quality Assurance

A. Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.5 Delivery, Storage, and Handling

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.6 Coordination

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - Products

2.1 Sheet Metals

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality, mill phosphatized shop primed for field painting.

2.2 Miscellaneous Materials

A. Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
   1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
   2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
C. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft.
D. Solder for Zinc: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by manufacturer.
E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 Manufactured Sheet Metal Flashing and Trim

A. Provide reglets of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.

1. Material: Galvanized steel, 0.0217 inch thick.
2. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers and with channel for sealant at top edge.
3. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
4. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.4 Fabrication, General

A. Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

D. Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

E. Provide lapped or bayonet-type expansion provisions in the Work.

F. Conceal fasteners and expansion provisions wherever possible on sheet metal flashing and trim, unless otherwise indicated.

G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal. Provide attachment devised in thicknesses as recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.5 Low-Slope Roof Sheet Metal Fabrications

A. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, and solder or weld watertight.
2. Fabricate copings from the following material:
   a. Galvanized Steel: 0.0396 inch thick.

B. Roof and Roof to Wall Transition Expansion-Joint Cover: Fabricate from the following material:
   1. Galvanized Steel: 0.0336 inch thick.

C. Base Flashing: Fabricate from the following material:
   1. Galvanized Steel: 0.0276 inch thick.

D. Counterflashing: Fabricate from the following material:
   1. Galvanized Steel: 0.0276 inch thick.

E. Roof-Penetration Flashing: Fabricate from the following material:
   1. Galvanized Steel: 0.0276 inch thick.

2.6 Miscellaneous Sheet Metal Fabrications

A. Equipment Support Flashing: Fabricate from the following material:
   1. Galvanized Steel: 0.0276 inch thick.

B. Overhead-Piping Dry Pans: Fabricate from the following material:
   1. Galvanized Steel: 0.0396 inch thick.

PART 3 - Execution

3.1 Examination

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation indicates Contractor’s acceptance of substrate condition.

3.2 Installation, General

A. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system. Torch cutting of sheet metal flashing and trim is not permitted.

B. Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating.

   1. Coat side of uncoated aluminum and lead sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.
4. At exposed conditions do not allow bituminous coating and roofing cement to be exposed.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

G. Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40° and 70° F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40° F.
2. Prepare joints and apply sealants to comply with requirements in Section 07920 "Sealants."

I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
1. Do not solder prepainted, and aluminum sheet.
2. Pretinning is not required for lead sheet.
3. Copper Soldering: Tin uncoated copper surfaces at edges of sheets using solder recommended for copper work.
4. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

3.3 Roof Flashing Installation

A. Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone.
C. Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone.

   1. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 24-inch centers.
   2. Anchor interior leg of coping with screw fasteners and washers at [24-inch] [20-inch] [18-inch] centers.

D. Install pipe or post counterflashing umbrella with close-fitting adjustable stainless-steel collar band with top edge flared for elastomeric sealant, extending over base flashing. Install stainless-steel draw band and tighten.

E. Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.

F. Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

3.4 Cleaning and Protection

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620
SECTION 07841 - Through-Penetration Firestop Systems

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:
   1. Division 15 Sections specifying duct and piping.
   2. Division 16 Sections specifying cable and conduit.

1.2 Performance Requirements

A. For penetrations through fire-resistance-rated constructions, including both blank openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

   1. Fire-resistance-rated walls including fire walls, fire partitions, fire barriers, and smoke barriers.
   2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

B. Provide through-penetration firestop systems with the following ratings determined per UL 1479.

   1. Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

   1. For piping penetrations for plumbing, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.3 Submittals

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction and type of penetrating item. Include firestop design designation of qualified testing agency that evidences compliance with requirements for each condition indicated.
1. Submit documentation, including illustrations, that is applicable to each through-penetration firestop system configuration for construction and penetrating items.

2. Where Project conditions require modification to a particular through-penetration firestop condition, submit engineering judgment drawings, with modifications marked, based on International Firestop Council practices, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Submit and obtain approval by authority having jurisdiction.

C. Qualification Data: For installer.

D. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

1.4 Quality Assurance

A. Provide an installer who specialized in the installation of firestopping systems and that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors," and experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to installer engaged by Contractor does not in itself confer qualification on buyer. Installer must be certified by manufacturer of firestopping material.

B. Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.

C. Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.


E. Conduct pre-installation meeting at Project site to comply with requirements in Section 01310 "Project Management and Coordination."

F. Firestopping manufacturer’s representative shall be onsite during installation of firestop systems. Representative to issue report stating that firestopping installation meets manufacturer’s written requirements and requirements of UL Fire Resistance Directory requirements.

G. Firestopping systems do not re-establish structural integrity of an assembly.

1.5 Delivery, Storage, and Handling

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, direct sunlight and UV exposure or other causes.
1.6 Project Conditions

A. Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturer’s written recommendations, or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.7 Coordination

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements. Coordinate with other trades to assure that firestop penetration materials and assemblies are installed at a time and manner that fits with sequence of Work and does not delay Work of other trades.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Owner's inspector at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner’s inspector, and building inspector, if required by authorities having jurisdiction.

PART 2 - Products

2.1 Manufacturers

A. Subject to requirements, provide products by one of, or equal to, the following:

2. Hilti, Inc.
3. 3M; Fire Protection Products Division.
4. Tremco; Sealant/Weatherproofing Division.
5. USG Corporation.

2.2 Firestopping, General

A. Provide through-penetration firestop systems and components that are compatible with one another; compatible with the substrates forming openings; and compatible with penetrants, if any, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience. Provide firestop systems that are unaffected by water. Do not use firestop materials that contain solvents.

B. Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 “Performance Requirements” Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials.
2. Temporary forming materials.
5. Steel sleeves.

2.3 Fill Materials

A. Provide through-penetration firestop systems containing the types of fill materials required for Through-Penetration Firestop Systems indicated on drawings. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

E. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
   2. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.4 Mixing

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - Execution

3.1 Examination

A. Examine substrates and conditions, with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work. Verify that penetration openings comply with listing requirements. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation of firestopping materials indicates acceptance of substrates.

3.2 Preparation

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.
B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

D. Test for Staining and Leaching: Staining and leaching of exposed surfaces by fire stopping materials, including but not limited to sealants, primers, fill materials, or masking tapes will not be acceptable. Test materials and surfaces for staining prior to installation of firestopping materials.

3.3 Through-Penetration Firestop System Installation

A. Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 Identification

A. Identify through-penetration firestop systems with preprinted metal labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners. Include the following information on labels:

1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.
3.5 Field Quality Control

A. Owner will engage a qualified, independent inspector to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.6 Cleaning and Protecting

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

3.7 Through-Penetration Firestop System Schedule

A. UL-classified systems are indicated and scheduled on the drawings; they refer to alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.

END OF SECTION 07841
SECTION 07920 - Sealants

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Section 03300 “Cast-in-Place Concrete.”
2. Section 07620 “Sheet Metal Flashing and Trim.”
3. Section 07841 “Through-Penetration Firestop Systems.”
4. Section 09250 "Gypsum Board."
5. Section 09512 “Suspended Ceilings.”

1.2 Definitions

A. Type S: Products finished prepackaged which no job-site mixing is required.

B. Grade P: Products having sufficient flow to fill joints in horizontal surfaces and remain level and smooth at temperatures as low as 40° F.

C. Grade NS: Nonsag sealant that permits application in joints on vertical surfaces without sagging or slumping when applied at temperatures between 40°F and 122° F.

D. Use NT: Classifies sealants designed for nontraffic exposure.

E. Use M, G, A: Refers to sealants which remain adhered, within given parameters, to various standard specimens.

F. Use O: Refers to substrate materials other than M, G, and A.

1.3 Performance Requirements

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

C. Staining and leaching by sealant or primer will not be acceptable. All stained materials must be cleaned to show no visible evidence of sealant or primer staining or leaching, or removed and replaced. Where doubt about staining exists, test a sample of material in question.

D. Provide sealants that are compatible with all building underlayments, paints, coatings, and waterproofing. Coordinate with work of those sections to determine compatibility.

1.4 Submittals

A. Product Data: For each sealant product indicated.
B. **Samples:** For each type and color of joint sealant required, provide Samples with joint sealants in \(\tfrac{1}{2}\)-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. **SWRI Validation Certificate:** Each sealant to be validated by SWRI’s Sealant Validation Program.

D. **Qualification Data:** For installer.

E. Warranties specified in this Section.

1.5 **Quality Assurance**

A. Provide sealant manufacturer's authorized installer who is approved or licensed for installation of elastomeric sealants required for this Project, and who has completed 5 years of joint sealant applications similar in materials, scope and extent to the Work indicated.

B. Obtain each type of joint sealant through one source from a single manufacturer.

C. Comply with the following:

1. ASTM C 919 – Practice for use of sealants in acoustical applications.

D. Conduct preinstallation meeting at Project site and review the following:

1. Submittals and sealant schedule.
2. Surface condition, weather conditions and substrate preparation.
3. Sequencing of installation and coordination with Work of other trades.
4. Installation methods and requirements.
5. Protection of Work.

1.6 **Project Conditions**

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40° F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
5. When cementitious substrates are not thoroughly cured and dry.

1.7 **Warranty**

A. Special Installer’s Warranty: Installer’s standard form in which installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within 5 (five) years from date of Substantial Completion.

B. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.8 Delivery, Storage and Handling

A. Deliver and store packaged materials in manufacturer’s original unopened containers with seals unbroken and labels intact until time of use. Store materials off ground and under cover to prevent damage or contamination to materials by water, freezing, foreign matter or other causes. Promptly remove from site any materials which show evidence of damage and immediately make all replacements necessary.

PART 2 - Products

2.1 Manufacturers

A. Subject to requirements, provide products by one of, or equal to, the following:

1. Dow Corning Corporation.
2. General Electric Co.
3. Pecora Corporation.
4. Sonneborn Building Products Division / ChemRex, Inc.
5. Tremco, Inc.

2.2 Materials, General

A. Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience. Provide joint sealants that are compatible with all flashings and underlayments.

B. Provide sealants and sealant primers that comply with VOC content requirements by authorities having jurisdiction.

C. Colors of Exposed Sealants: As selected by Architect from manufacturer’s full range.

D. Elastomeric sealants shall be nonstaining to porous substrates. Provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

E. Provide mildew resistant sealants.

F. Provide products that are permanently flexible.

2.3 Backing

A. Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin as recommended in writing by sealant manufacturer,) and of size and density to control sealant depth and
otherwise contribute to producing optimum sealant performance. Provide polyethylene tape for joints too shallow to allow use of foam rod.

C. Provide polyethylene bond breaker adhesive tape or other plastic tape recommended in writing by sealant manufacturer for preventing sealant from adhering to joint surfaces where such adhesion would result in sealant failure.

2.4 Miscellaneous Materials

A. Provide primers recommended in writing by sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction sealant-substrate tests and field tests.

B. Provide cleaners for surfaces, acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Provide nonstaining, nonabsorbent masking tape compatible with joint sealants and surfaces adjacent to joints.

D. Cleaning Cloths: Clean soft absorbent, lint free, cloths.

PART 3 - Execution

3.1 General

A. Prepare substrates and apply sealant in accordance with manufacturer’s written instructions.

B. Handle and apply sealant materials in a manner that complies with regulations of jurisdictions having authority.

C. Do not use sealants in below grade applications, in areas of water immersion or on materials bleeding oils, plasticizers and solvents.

D. When applying sealants to metal and zinc coated substrates verify that sealant will not cause discoloration or corrosion.

E. Allow sealants to fully cure before concealing within elements of construction.

F. Complete horizontal joints prior to vertical joints. Lap vertical joint sealant over and onto horizontal sealant.

3.2 Examination

A. Examine joints indicated to receive joint sealants, with installer and sealant manufacturer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting sealant performance and warranty requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation constitutes acceptance of substrates and conditions by Contractor, Installer and Manufacturer.

3.3 Preparation
A. Clean out joints immediately before installing joint sealants to comply with sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), curing compounds, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, frost, soap residue, soil or other sealing compounds.

2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Make sure that apparently clean surfaces are not covered with a thin film of dust.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Do not flood surfaces with cleaners and solvents.

B. Prime joint substrates, where recommended in writing by sealant manufacturer and based on preconstruction sealant-substrate tests or prior experience. Apply primer to comply with sealant manufacturer's written instructions. Confine primers to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Use masking tape to create neat sealant lines and where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Do not allow masking tape to touch clean surfaces to which sealant will adhere. Remove tape immediately after tooling without disturbing joint seal.

### 3.4 Installation of Sealants

A. Comply with sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. For general sealant installation comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. For acoustical sealant application standards, comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates in continuous ribbons without gaps or air pockets.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Do not allow sealants to overflow confines of joint or onto adjoining Work.

G. Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Tool sealant within time limits recommended in writing by sealant manufacturer in one continuous stroke within 10 minutes of application and before sealant forms a skin, to a slightly concave joint configuration slightly below adjoining surfaces per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Where sealant joints occur between horizontal and vertical surfaces fill joint to form a slight cove so that joint will not trap and pool moisture and dirt.
5. Use masking tape to protect surfaces adjacent to recessed tooled joints.
6. Remove masking tape immediately after tooling and before sealant skin forms (within 5 – 10 minutes.)

3.5 Cleaning

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur. Do not allow cleaning materials or solutions to come in contact with joint sealant proper.

3.6 Protection

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 Sealant Schedule

<table>
<thead>
<tr>
<th>Application</th>
<th>Sealant Description</th>
<th>Type</th>
<th>Grade</th>
<th>Class</th>
<th>Exposure Use</th>
<th>Substrate Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior perimeter joints of exterior openings</td>
<td>Single component neutral curing silicone sealant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior joints between plumbing piping, walls, and floors</td>
<td>Single component mildew resistant neutral curing silicone sealant</td>
<td>S</td>
<td>NS</td>
<td>25</td>
<td>NT</td>
<td></td>
</tr>
<tr>
<td>Vertical joints on exposed surface of interior masonry, concrete and gypsum board walls</td>
<td>Single component neutral curing silicone sealant</td>
<td>S</td>
<td>NS</td>
<td>25</td>
<td>NT</td>
<td></td>
</tr>
</tbody>
</table>
END OF SECTION 07920
SECTION 09250 - Gypsum Board

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Section 06402 “Interior Architectural Woodwork.”
2. Section 07841 “Through-Penetration Firestop Systems.”
3. Section 09900 “Painting.”

1.2 Submittals

A. Product Data: For each type of product indicated.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
2. Textured Finishes: 12-inch by 12-inch for each textured finish indicated and on same backing indicated for Work.

1.3 Quality Assurance

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. Applicator of gypsum board products and finishes to have a minimum of 10 years experience with similar installations and applications.

1.4 Storage and Handling

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.5 Project Conditions

A. Comply with ASTM C 840 for environmental requirements or gypsum board manufacturer's written recommendations, whichever are more stringent. Provide for more expensive condition at no additional cost to Owner.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - Products

2.1 Panels, General

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 Interior Gypsum Board

A. Complying with ASTM C 36 or ASTM C 1396, as applicable to type of gypsum board indicated and whichever is more stringent. Provide in thickness and types indicated.

1. Subject to requirements, provide products by one of, or equal to, the following:
   a. G-P Gypsum.
   c. PABCO Gypsum.
   d. USG Corporation.

B. Regular Type: Long Edges: Tapered.

C. Fire Rated Long Edges: Tapered.


2.3 Trim Accessories

A. Interior Trim: ASTM C 1047.


2. Shapes:
   a. Cornerbead.
   b. LC-Bead: J-shaped; exposed long flange receives joint compound.
   c. U-Bead: J-shaped; exposed short flange does not receive joint compound.

2.4 Joint Treatment Materials

A. General: Comply with ASTM C 475.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.5 Auxiliary Materials

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick. Provide length of screw for fastening through single or multi-layer gypsum board applications that will fully penetrate flange of steel stud or provide 1 inch embedment into wood sheathing/stud. Provide fastener appropriate to supporting substrate.

C. Acoustical Sealant: As specified in Section 07920 "Sealants."

PART 3 - Execution

3.1 Examination

A. Examine areas and substrates, with installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Proceeding with installation indicates acceptance of substrate conditions by Contractor.

3.2 Applying and Finishing Panels, General

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attach panels to metal framing so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Apply preliminary layers of fire rated gypsum board to locations in fire rated construction that will be concealed by other construction.

J. Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

3.3 Applying Interior Gypsum Board

A. Install interior gypsum board in locations indicated on Drawings.

B. Single-Layer Application:
   1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
   2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise required by fire-resistance-rated assembly, and minimize end joints. Stagger abutting end joints not less than one framing member in alternate courses of panels. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
   3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
   4. Apply gypsum panels to supports with steel drill screws.

3.4 Installing Trim Accessories

A. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners, unless otherwise indicated.
   2. LC-Bead: Use at exposed panel edges.
   3. U-Bead: Use at exposed panel edges.
3.5 **Finishing Gypsum Board**

A. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Comply with Gypsum Association GA 214, finish panels to levels indicated on Drawings and according to ASTM C 840.

E. Primer and its application to surfaces are specified in other Division 9 Sections.

3.6 **Protection**

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09250
SECTION 09512 – Suspended Ceilings

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 09250 "Gypsum Board."
   2. Division 15 and Division 16 Mechanical and Electrical sections for light fixtures and registers.

1.2 Submittals

A. Product Data: For each type of product indicated.

B. Samples: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Suspended Tile: 12 inch x 12 inch samples of each type, color, pattern, and texture.

C. Qualification Data: For testing agency.

D. Research/Evaluation Reports: For suspended tile ceiling and components and anchor and fastener type.

E. Maintenance Data: For finishes to include in maintenance manuals.

1.3 Quality Assurance

A. Source Limitations:
   1. Suspended Ceiling Tile: Obtain each type of style and finish through one source from a single manufacturer.
   2. Suspension System: Obtain each type through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide suspended tile ceilings that comply with the following requirements:
   1. Fire-Resistance Characteristics: Where indicated, provide suspended tile ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
   2. Surface-Burning Characteristics: Provide suspended tiles with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84: Smoke-Developed Index: 450 or less.

C. Seismic Standard: Provide suspended tile ceilings designed and installed to withstand the effects of earthquake motions according to California Building Code and Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.
D. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion. Mockups to show all components of suspended ceiling system including tiles, grid, hangers and connectors.

E. Conduct pre-installation meeting at Project site to comply with requirements in Section 01310 "Project Management and Coordination."

1.4 Delivery, Storage, and Handling

A. Deliver tiles, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing tiles, permit them to reach room temperature and a stabilized moisture content.

C. Handle tiles carefully to avoid chipping edges or damaging units in any way.

1.5 Project Conditions

A. Do not install suspended tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use. Operate ventilation system for not less than 48 hours before beginning suspended tile ceiling installation.

1.6 Coordination

A. Coordinate layout and installation of tiles and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.7 Extra Materials

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Suspended Ceiling Units: Full-size tiles equal to 1.0 percent of quantity installed.
2. Suspension System Components: Quantity of each concealed grid and exposed component equal to 1.0 percent of quantity installed.

PART 2 - Products

2.1 Ceiling Tiles, General

A. Match existing.

B. Provide tiles in configurations indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.

C. Match appearance characteristics indicated for each product type. Where appearance characteristics of tiles are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' Suspended Ceilings

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proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

D. Provide ceiling tiles treated with manufacturer's standard antimicrobial formulation throughout tile, that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273 and evaluated according to ASTM D3274 or ASTM G21.

2.2 Acoustic Tiles for Suspended Ceiling

A. Match existing.

B. Subject to requirements, provide products by one of, or equal to, the following:

1. Armstrong World Industries, Inc.; 2 x 4 Dune/Second Look II.

C. Classification: Provide tiles complying with ASTM E1264 for type, form, and pattern as follows:

1. 9/16” Angled Tegular.

2.3 Metal Suspension Systems, General

A. Provide manufacturer's metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C635.

B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

C. Size attachment devices for five times the design load indicated in ASTM C635, Table 1, "Direct Hung." Comply with seismic design requirements. Provide cast-in-place anchors in concrete of carbon-steel zinc plated components to comply with ASTM B6533, Class Fe/Zn 5 for Class SC 1 service condition.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A641, Class 1 zinc coating, soft temper.

2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch-diameter wire.

E. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized steel sheet complying with ASTM A653, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.

H. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure tiles in-place.
2.4 Metal Suspension System for Tile Ceiling

A. Match existing:
   1. USG Interiors, Inc.; <Insert product name or designation>.

B. Direct-Hung, Double-Web, Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, G30 coating designation.
   1. Structural Classification: Heavy-duty system.
   2. Access: Upward and end pivoted, with initial access openings of size indicated below and located throughout ceiling within each module formed by main and cross runners, with additional access available by progressively removing remaining suspended tiles. Initial Access Opening: In each module.

2.5 Metal Edge Moldings And Trim

A. Subject to requirements, provide products by one of, or equal to, the following:
   1. Armstrong World Industries, Inc.; <Insert product name or designation>.
   2. USG Interiors, Inc.; <Insert product name or designation>.

B. Provide roll-formed, sheet-metal edge moldings and trim in profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

C. Provide extruded-aluminum edge moldings and trim of profile indicated, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:
   1. Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 for Alloy and Temper 6063-T5.
   2. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
   4. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

PART 3 - Execution

3.1 Examination

A. Examine substrates, areas, and conditions, including structural framing and substrates to which suspended tile ceilings attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of suspended tile ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation indicates acceptance of substrate conditions by Contractor.
3.2 Preparation

A. Before installing adhesively applied tiles on wet-placed substrates such as cast-in-place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.

B. Measure each ceiling area and establish layout of tiles to balance border widths at opposite edges of each ceiling. Comply with layout shown on reflected ceiling plans.

3.3 Installation, Suspended Tile Ceilings

A. Install suspended tile ceilings to comply with ASTM C 636 and seismic design requirements per California Building Code.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
7. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
8. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
9. Do not attach hangers to steel deck tabs.
10. Do not attach hangers to steel roof deck. Attach hangers to structural members.
11. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
12. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of suspended tile ceiling area and where necessary to conceal edges of tiles.

Suspended Ceilings

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1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Arrange directionally patterned tiles as indicated on reflected ceiling plans.

G. Install suspended tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.

   1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
   2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.
   3. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 Field Quality Control

A. Owner will engage a qualified special inspector to perform the following special inspections and prepare reports:

   1. Suspended ceiling system.
   2. Hangers, anchors and fasteners.

3.5 Cleaning

A. Clean exposed surfaces of suspended tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09512
SECTION 09650 - Resilient Flooring

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections:
   1. Section 03300 “Cast-in-Place Concrete.”

1.2 Submittals

A. Product Data: For each type of product indicated.

B. Samples: 12 inch x 12 inch samples of sheet roll products.

C. Qualification Data: For qualified installer.

D. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.3 Quality Assurance

A. Provide a qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient products indicated. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required. Provide installer with 5 years documented experience with installing products specified.

B. Fire-Test-Response Characteristics: Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm. NFPA E 648.

C. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Build mockups for floor tile including resilient base and accessories. Minimum 100 sq. ft. for each type, color, and pattern.

1.4 Delivery, Storage, and Handling

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50° F or more than 90° F. Store resilient products layered flat on flat surfaces.

1.5 Project Conditions

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70° F or more than 95° F, in spaces to receive floor tile during the following time periods:

   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.
B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55°F or more than 95°F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

F. Provide necessary testing to assure moisture content and pH levels of substrate are within acceptable range per flooring manufacturer's recommendations and warranty requirements. Where resilient flooring is applied directly to concrete substrates cured with liquid applied curing compounds test for compatibility with curing compounds. Submit test results in writing.

G. Verify compatibility between joint sealants in substrate and adhesive used to adhere resilient products. Provide adhesive that is compatible with substrate.

1.6 Extra Materials

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish 1 box of each type, color, and pattern of floor tile installed.

PART 2 - Products

2.1 Vinyl Composition Tile

A. Match existing:


C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 inches by 12 inches.

F. Coefficient of Friction: 0.6 minimum per ASTM D 2047.

2.2 Resilient Base

A. Match existing resilient base:
   1. Burke Mercer Flooring Products; Division of Burke Industries, Inc. Rubber wall base, Color No. 103 Espresso.

   1. Material Requirement: Type TS (rubber vulcanized thermoset).
C. Minimum Thickness: 0.125 inch.

D. Height: As indicated on Drawings.

E. Lengths: Coils in manufacturer’s standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Finish: As selected by Architect from manufacturer’s full range.

I. Colors and Patterns: As selected by Architect from full range of colors.

2.3 Installation Materials

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Stair-Tread-Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates that do not conform to tread contours.

C. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

   a. Vinyl Flooring Adhesives: Not more than 50 g/L.

D. Integral-Flash-Cove-Base Accessories:

2. Cap Strip: Square metal cap.

PART 3 - Execution

3.1 Examination

A. Examine substrates, with installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation indicates Contractor’s acceptance of substrate conditions

3.2 Preparation

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Perform alkalinity and adhesion testing. Proceed with installation only after substrates pass testing. Provide written evidence that alkalinity and pH levels are within manufacturer’s written recommendations.
   4. Perform moisture testing. Proceed with installation only after substrates pass testing. Provide written evidence that moisture levels are within manufacturer’s written recommendations.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install flooring until it is the same temperature as space where they are to be installed. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation. Maintain temperatures.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 Floor Tile Installation

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter. Lay tiles square with room axis in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
   1. Lay tiles matching grain direction of existing tile.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door in closed position.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Seamless Installation:
1. **Heat-Welded Seams**: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.

2. **Chemically Bonded Seams**: Bond seams with chemical-bonding compound to permanently fuse sections into a seamless floor covering. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on floor covering surfaces.

### 3.4 Resilient Base Installation

A. Comply with manufacturer’s written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer’s recommended adhesive filler material.

G. **Job-Formed Corners**:

   1. **Outside Corners**: use straight pieces of minimum 48 inch lengths. Form without producing discoloration (whitening) at bends.

   2. **Inside Corners**: Use straight pieces of minimum 48 inch lengths.

### 3.5 Cleaning and Protection

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Perform the following operations immediately after completing flooring installation:

   1. Remove adhesive and other blemishes from exposed surfaces.

   2. Sweep and vacuum surfaces thoroughly.

   3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. **Floor Polish**: Remove soil, visible adhesive, surface blemishes and clean flooring surfaces before applying liquid floor polish. Apply two coats.

E. Cover flooring until Substantial Completion.

**END OF SECTION 09651**
SECTION 09900 - Painting

PART 1 - General

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Section 06402 “Interior Architectural Woodwork.”
2. Section 07620 “Sheet Metal Flashing and Trim.”
3. Section 09250 “Gypsum Board.”

1.2 Submittals

A. Product Data: For each type of product indicated.

B. Samples: For each type of paint system and in each color and gloss of topcoat indicated.

1. Submit 7 (seven) samples on rigid backing, 8 inches square.
2. Step coats on samples to show each coat required for system including primer.
3. Label each coat of each sample with manufacturer and product designation name and number.

C. Submit manufacturer’s current written instructions and recommended methods of installation including
substrate preparation and application rates.

1.3 Quality Assurance

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting
Specification Manual" for products and paint systems indicated.

B. Provide painter with 10 (ten) years experience in the type of painting applications specified for this
project.

C. Coordinate with other trades and Work of other Sections that will be applying primers to Work of those
Sections, to ensure compatibility of the total paint system over substrate. Provide information on top
coats to ensure use of compatible primers. Omit primer on metal surfaces that have been shop primed.

D. This Section includes painting of all Work, items and surfaces which are normally painted in a building
of this type and level of quality, and shall be included in the Contract, whether or not painting of a
specific item or surface is specifically called out and included in the drawings or mentioned in
specifications.

E. Schedule indications on drawings are general and do not necessarily define the detail requirements.
Include all detailed refinements for the required complete finishing of all spaces and rooms.

F. Include painting of all items and assemblies even if color is not yet indicated.
1.4 Delivery, Storage, And Handling

A. Deliver paint materials to project site in manufacturer’s original unopened containers bearing manufacturer’s label, with manufacturer’s name, logo, paint type, sheen, stock number, date of manufacture, contents by volume for pigment solids and vehicle constituents, thinning instructions, color name and number, and shelf life. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45° F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Place oily rags and waste in a metal container and remove from project site daily.

1.5 Project Conditions

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 55° and 95° F. Avoid painting surfaces when exposed to direct sunlight.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5° F above the dew point. Do not apply paint in damp or rainy conditions, or to damp or wet surfaces, or when inclement weather is expected within the drying/curing time recommended in writing by manufacturer.

C. Moisture test surfaces prior to applying any paint coatings. Verify that substrates have a maximum moisture content that complies with paint manufacturer’s written recommendations, and in no case higher than 12% maximum moisture content. Submit written test results.

1.6 Extra Materials

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 (five) percent, but not less than 5 gal. (5 gallons) of each material and color applied.

PART 2 - Products

2.1 Manufacturers

A. Subject to requirements, provide products by one of, or equal to, the following:

1. Benjamin Moore & Co.
2. Dunn-Edwards Corporation.
3. Frazee Paint.
5. Vista Paint.

2.2 Paint Materials


B. Provide materials for use within each paint system that are compatible with one another and compatible with substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
C. For each paint system, provide products recommended in writing by topcoat manufacturer for substrate indicated. Provide all products within a paint system by a single manufacturer including prep coats and primers.

D. Provide products that comply with jurisdictional requirements for VOC content, exclusive of colorants added to a tint base.

E. Provide paint that contains 30-45% solids, minimum.

F. All paints and primers shall be ready mixed in original containers.

PART 3 - Execution

3.1 Examination

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content, pH levels and other conditions affecting performance of work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Unsatisfactory surfaces and materials must be corrected by applicable trade before painting.

D. In reconstruction areas where permanent installed items have been removed; provide textures, primers, and coatings as needed to eliminate ghosting and to make surface visually indistinguishable in all respects to adjacent exposed surfaces.

E. Begin coating application only after unsatisfactory conditions have been corrected and are within manufacturer’s written recommendations and requirements of Contract documents. Architect shall be final judge on satisfactory conditions. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

F. Notify Architect with written RFI of any problems anticipated using paint materials specified over substrates indicated or project conditions. Failure to provide written RFI prior to starting painting operations constitutes Contractor's acceptance of substrates and conditions.

3.2 Preparation

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" for preparation of substrates indicated. Surfaces which cannot be prepared or painted as specified shall be immediately brought to the attention of the Architect in writing. Starting of Work without such written notification constitutes Contractor’s acceptance of substrates and conditions.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
   2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   3. Do not apply paint in areas where dust is being generated.
C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, dust, and incompatible paints and encapsulants.

1. Remove incompatible primers and coatings, and reprime substrate with compatible primers as required to produce paint systems indicated.
2. Prepare all surfaces per manufacturer’s written recommendation and per SSPC SP1, SP2 and SP3 as required by substrate and paint system requirements and as required by Contract documents.
3. Screen, cover or mask adjacent surfaces and materials which are not to receive paint or paint dust. Use appropriate light or medium tack masking tape.

D. Ferrous Metal Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer and requirements of contract documents. In severe exposure conditions such as coastal areas subject to salt water, humid environments, or environments with exposure to corrosive chemicals, apply two coats of primer to ferrous metals. Surfaces shall be primed within 3 hours after preparation.

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal with a solvent or water based degreaser. To produce clean surfaces, etch cleaned galvanized metal surfaces with an etching solution, such as Jasco Prep and Prime or approved equal before applying primer. Clean acid etch solution completely from surfaces. Prime surface within 3 hours of acid etching.

F. Aluminum Substrates: Remove surface oxidation.

G. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth. For non-flat paint sheens, apply a preparation coating such as Frazee 067 Prep Step or approved equal, prior to primer and finish coats. All drywall surfaces to be dust free before painting. Skim coated drywall shall be sealed with sealer recommended in writing by paint manufacturer.

H. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

I. Existing surfaces to be recoated shall be thoroughly cleaned and prepared as recommended in writing by paint manufacturer. Patches and bare areas shall be spot primed with same primer as required for new surfaces.

J. Newly poured bare concrete floors to be cleaned with a 5 percent solution of muriatic acid or other acid etching cleaner. Flush floor with clean water to remove acid, neutralize with ammonia and rinse; allow to dry.

K. Existing floors scheduled to be painted shall be bead blasted to expose bare concrete in all areas. Test for moisture level as required by Contract documents. Vacuum before painting.

3.3 Application

A. Coating systems specified indicate a minimum number of coats. Do not thin primers or paints; apply paint taken directly from manufacturer’s containers. Apply at coverage rates recommended by paint manufacturer. Apply primer coat as recommended by manufacturer to properly prepare surface for finish coats, one coat minimum. Apply additional primer coats, as necessary, to cover suction spots or unsealed areas, to properly prepare surface for finish coats at no additional cost to Owner. Apply finish coats as recommended by manufacturer, two coats minimum. Apply additional finish coats as needed to completely hide base substrates and achieve the desired consistency, uniformity in finish surface, and sheen at no additional cost to Owner

B. Apply paints according to manufacturer’s written instructions.
1. Flat and eggshell finishes may be rolled or brushed on drywall, plaster and CMU. Spray-apply primer, intermediate and finish coats on all other surfaces.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces. Paint inside surfaces of all panel covers and inside of all boxes.

C. Do not paint over dirt, rust, scale, grease, mildew, mold, moisture scuffed surfaces, or conditions detrimental to durable uniform paint film.

D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. If undercoats or other conditions show through topcoat, apply additional coats until cured film as a uniform paint finish, color, and appearance. Comply with manufacturer’s written recommendations for drying times between succeeding coats.

E. Lightly sand and remove all dust between succeeding coats.

F. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

G. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Uninsulated metal piping and conduit.
2. Uninsulated plastic piping.
3. Pipe hangers and supports.
4. Tanks that do not have factory-applied final finishes.
5. Visible portions of internal surfaces of metal ducts to a point 3 feet back from duct outlet, without liner, behind air inlets and outlets.
7. Paint all exposed surfaces in plenum spaces that can be visually seen through return and supply registers including; equipment, ductwork, piping and conduit.
8. Paint all recessed fire sprinkler head cover plates, semi-recessed and exposed sprinkler head trims to match adjacent surfaces.

H. Do not paint over prefinished mechanical equipment, electrical switch covers, and transformers, UL labels, equipment and piping labels. Do not paint over fuseable links or sprinkler heads. Paint exposed pipes, ductwork, conduit and supporting hangers and suspension systems to match adjacent surfaces. Do not paint valve assemblies.

I. Make edges of paint adjoining other material or color clean and sharp with no overlapping.

J. Refinish whole wall where portion of finish is deemed unacceptable by Architect.

K. All materials shall be spray-applied evenly with proper film thickness and free of runs, sags, skips and other defects, except drywall, plaster and CMU with flat or eggshell finish. Varnishes shall be sanded lightly between coats, dusted and cleaned before recoating.

L. Hardware, hardware accessories, plates, lighting fixtures and similar items in place shall be removed prior to painting and replaced upon completion of each space.
M. Heating and other equipment adjacent to walls shall be disconnected, using workmen skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, expertly replace and reconnect.

N. Wash bare metal grilles and ducts indicated to be painted with solvent, wash with etching solution then prime and paint as scheduled.

O. Paint doors on tops, bottoms and edges same as door faces after fitting.

P. Paint backside and inside faces of access panels, cover doors, frames, and removable or hinge covers to match exposed fronts.

Q. Provide wet paint signs, barricades, warning tape and other devises to protect newly finished surfaces. Remove after Work is completed and paint has thoroughly dried.

3.4 Field Quality Control

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint rejected surfaces. Contractor at Owner’s discretion shall remove rejected materials from previously painted surfaces prior to re-preparing surfaces and re-applying approved paint coating systems.

3.5 Cleaning And Protection

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces. Clean and repair blemishes to all surfaces caused by Work of this Section.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Leave surfaces in a first class condition.

E. Runs, sags, misses, holidays, stains and other defects in painted surfaces, including inadequate coverage, mil thickness, inconsistent sheen or uniformity of appearance shall be satisfactorily repainted as necessary. If a portion of a larger area is deemed unsatisfactory, the entire area of surface shall be stripped, re-prepared and re-painted with approved paint systems, as Owner’s discretion.
3.6 Painting Schedule

A. The following paint schedule is based upon Frazee Paint Systems as a basis of design; other paint systems may be proposed on an “approved equal” basis. Architect is sole judge of acceptability of paint system.

B. Interior Paint Systems:

1. Gypsum Board Drywall:

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<th>Product</th>
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<tr>
<td>Eggshell</td>
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<td>2nd Coat</td>
<td>029 Envirokote EG</td>
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<td></td>
<td></td>
<td>3rd Coat</td>
<td>029 Envirokote EG</td>
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2. Non-Ferrous Metal: Galvanized – Aluminum:

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<th>Finish</th>
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<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-Gloss</td>
<td>100% Acrylic</td>
<td>1st Coat</td>
<td>561 Acrylic Metal Primer</td>
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<tr>
<td></td>
<td></td>
<td>2nd Coat</td>
<td>126 Envirokote SG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3rd Coat</td>
<td>126 Envirokote SG</td>
</tr>
<tr>
<td>Gloss</td>
<td>100% Acrylic</td>
<td>1st Coat</td>
<td>561 Acrylic Metal Primer</td>
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<tr>
<td></td>
<td></td>
<td>2nd Coat</td>
<td>143 Mirro Glide GL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3rd Coat</td>
<td>143 Mirro Glide GL</td>
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3. Ferrous Metal: Iron – Steel

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<th>Finish</th>
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<td>143 Mirro Glide GL</td>
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END OF SECTION 09900
SECTION 15400 - Plumbing

PART 1 - General

1.1 Description

A. Division 1 applies to this section. Provide plumbing as indicated, specified and required.

1.2 Product Handling

A. Protection: Take all precautions necessary to protect the materials of this section before, during, and after installation.

B. Replacements: In the event of damage, immediately repair all damaged and defective work to the approval of the Architect at no additional cost to the Owner.

1.3 Location and Accessibility

A. Valves, motors and other devices requiring service, maintenance and adjustment shall be placed in fully accessible positions and locations.

B. Drawings: Coordinate all space requirements with other trades. All offsets and interferences may not be indicated due to the scale of the drawings.

1.4 Quality Assurance

A. Codes and Standards:

1. All governing codes, ordinances and agencies, in accordance with the provisions of Division 1 of these specifications.

B. Warranty: The contractor shall furnish a written warranty for labor, materials and equipment provided under this contract in accordance with the provisions of Division 1 of these specifications.

1.5 Submittals

A. Manufacturer's Literature: Submit brochures on all materials and equipment to the Architect in accordance with the provisions of Division 1 of these specifications.

B. Other Submittals:

1. Shop Drawings.

2. Sterilization Test Report

3. Test Data.


5. Record Drawings.
PART 2 - Products

2.1 General

A. Pipe Escutcheons: Provide polished chromium plate and brass set screw escutcheons where plumbing pipes pass through walls, floors, ceilings, and partitions in finished portions of building, including pipes at fixtures.

B. Pipe Identification:

1. Piping Identification Per ANSI Standards: Each individual pipeline shall be marked for quick and easy identification as to content and character of material carried in the pipes by Seton SNA or STR markers.

2. Markers shall be installed and spaced at not more than 8 ft. intervals and so located that markers shall be visible where piping system is exposed.
   a. One marker shall be installed at each side of valves, special fittings and at branch take-off. In furred spaces install one band 2 ft. above floor and 19 in. below ceiling line.
   b. Furnish two identification charts complete with glass and frame showing list of materials carried in the piping system, classified by nature of its contents and respective identifying colors.

3. Color scheme shall be approved. Base color for markers shall be as follows:
   - Domestic hot water - Yellow w/Black Letters
   - Domestic cold water - Yellow w/White Letters
   - Fuel gas - Yellow w/Black Letters
   - Fuel oil - Yellow w/Black Letters
   - Industrial water - Green w/White Letters
   - Irrigation - Green w/White Letters
   - Sanitary sewer - Green w/White Letters
   - Sanitary vent - Green w/White Letters
   - Storm drains - Green w/White Letters

C. Materials: Materials when not otherwise definitely specified shall conform to the applicable standards.

D. Equal Materials and Substitutions: In addition to manufacturers specified, the following shall also be considered equal, provided corresponding models meet specified requirements. Equivalent substituted equipment named herein shall be submitted to Architect for approval. Submit alternate selections at time of bid, listing major equipment

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MANUFACTURER</th>
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<tbody>
<tr>
<td>1. Solders:</td>
<td>Handy-Harman, Lucas, Milhaupt</td>
</tr>
<tr>
<td>2. Pipe Hangers &amp; Supports:</td>
<td>Toleo, B-Line, Hilti</td>
</tr>
<tr>
<td>3. Insulation:</td>
<td>Manville, Fiberglas</td>
</tr>
</tbody>
</table>
2.2 **Pipe and Fitting Schedule**

A. Condensate Drains: Type M copper tube, ASTM B88 and wrought copper fittings, ANSI B16.22, solder joint type. Coordinate condensate trap installation with air conditioning unit manufacturer. All interior condensate drain piping shall be insulated.

2.3 **Materials for Joints, Fittings and Valves**

A. Solder and Flux

1. Copper Indirect and Condensate Drainage Piping: Lead-free solder with non-corrosive paste flux.

B. Welded Joints: Welding shall be performed only by qualified welders, and shall comply with ASME Boiler Construction Code, ANSI Code for pressure piping, and state requirements.

C. Unions and Gaskets:

1. 2 in. and under for steel pipe: Screwed malleable-iron ground joint, Class 150 WOG, with brass-to-iron seat, galvanized or black to suit service.

2. 2-1/2 in. and larger for steel pipe: Cast-iron flanged gasket type, conforming to ANSI B16.1, galvanized or black to suit service, or 150 lb. forged steel slip-on flanges.


4. Dielectric Unions: Epco, complete with isolators and gaskets of same size as pipe, galvanized or black to suit service.

5. Dielectric Flanges: F.H. Maloney Co., Type E flanges for cathodic insulation.


2.4 **Pipe Hangers**

A. Hangers shall be supplied with factory installed isolation and di-chromate finish.

1. 2 in. and smaller: Grinnell F69.

2. 2-1/2 in. and larger: Grinnell F65.

3. Concrete inserts: Grinnell 281 and 282.


5. Riser clamps for other piping: Grinnell 261.

2.5 **Pipe Sleeves**

A. Provide at concrete or masonry exterior bearing walls, Adjust-to-Crete, Paramount, or Sperzel Cretesleeve. Wall sleeves shall be flush with finished surface. Sleeves shall be sized to allow 1/2 in. clearance around pipe or insulation. Insulation and covering shall be continuous through sleeves.
B. At exterior walls below grade provide a modular mechanical seal consisting of inter-locking EPDM rubber links shaped to continuously fill the annular space between the pipe and the wall opening with a molded high density polyethylene sleeve water-stop ring, end caps and reinforcing ribs. ASTM B117, ISO 9002. Mechanical seals shall be “Thunderline” Link Seal, or approved equal.

2.6 Insulation

A. All pipe insulation shall comply with the State of California Energy Conservation Standards. Insulation thicknesses indicated are based on insulation having thermal resistances in the range of R-4.0 to R-4.6 per inch of thickness on a flat surface at a mean temperature of 75 degrees F. Thicknesses indicated are minimum and shall be increased proportionately for materials having R values less than 4.0 per inch of thickness or may be reduced for materials having R values greater than 4.6 per inch thickness. Install pipe insulation after piping is installed, tested and approved and is in clean, dry condition. Firmly butt insulation joints.

B. Insulate all condensate drain piping with glass fiber pipe insulation with factory applied white jacket, J-M Micro-Lok 650 AP, 1 in. thick for pipe sizes of 1/2 in. to 1 in., and 1-1/2 in. thick for pipe sizes to 1-1/4 in. and larger. Insulate fittings and valves with preformed insulation with PVC premolded one piece fitting cover, J.M. Zeston cover. Adhere longitudinal laps and butts of strips of jacket with factory applied pressure sensitive tape system, J-M AP-T. Flanges and unions shall not be covered.

PART 3 - Execution

3.1 Surface Conditions

A. Inspection: All plumbing shall be installed in accordance with the requirements of all governing authorities, the original design, and the referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Architect.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3. Interferences between installed work of various trades due to lack of coordination shall be resolved by Architect whose decision is final. Relocate or offset any work as required to accommodate work of other trades at no extra cost to the Owner when so directed by the Architect.

3.2 Locations and Space Requirements

A. Contractor shall fully inform himself regarding peculiarities and limitations of spaces available for installation of work under this division. Drawings indicate desired location and arrangement of piping, equipment and other items, and are to be followed as closely as possible. Work specified and not clearly defined by drawings shall be installed and arranged in a manner satisfactory to Architect. In event changes in indicated locations and arrangements are deemed necessary by Architect, they shall be made by Contractor without additional charge provided the change is ordered before work is installed and no extra materials are required.

B. Verify all spaces, dimensions for all fixtures, equipment, tenant or Owner-furnished equipment and equipment furnished under other sections.
C. Obtain all necessary rough in data and dimensions for all fixtures, equipment, tenant or Owner-furnished equipment and equipment furnished under other sections.

D. Maintain ample headroom clearances and accessibility. Maintain ceiling heights.

E. Constantly check work of other trades to prevent interference with this installation.

3.3 Pipe Installation

A. Make pipe runs straight and true. Springing or forcing piping into place is not permitted. Install in manner to prevent any undue strain on equipment. Make joints smooth and unobstructed inside and out, and ream pipe ends thoroughly to remove burrs. Conceal piping in finished portions of the buildings except as otherwise directed or indicated. Cap or plug ends and openings in pipe and fittings immediately to exclude dirt until equipment is installed or final connections are made. Make pipe size reductions with reducing fittings. Use no bushings unless specifically authorized. Use no close nipples. Proceed to rough in as rapidly as general construction of building will permit and complete and test before any lathing, plastering, or drywall, or other finish work is started. Fit work to available space and accurately rough in. Grade and valve water piping so as to provide for complete drainage and control of the system. Provide clamps and/or concrete thrust blocks at dead ends, angles, or other points where separation of joints may occur. Grade vent piping to allow piping to free itself of condensation or water.

B. Install piping to clear beams unless sleeving is indicated. Constantly check work of other trades to prevent interference with this installation. Obtain approval from Architect if coring or cutting of concrete work is necessary due to failure to install required sleeves prior to the time of concrete pour. Cost of coring and cutting work shall be borne by the subcontractor.

C. Exposed Plated or Enameled Pipe: Make connections to equipment with special care. Show no tool marks or threads.

D. Dielectric Unions: Make connections between two dissimilar metal pipes with dielectric unions.

E. Unions: Provide a union at both sides of automatic valves, at equipment connections and elsewhere indicated or required, unless flanges are indicated.

F. Floor, Wall and Ceiling Plates: Provide where pipes pierce finished surfaces.

G. Noise: Install soil, waste, and water piping in manner that prevents any unusual noise from flow of water under normal conditions.

H. Shutoff Valves: Provide where indicated and required for adequate control of systems and for isolation of fixture groups and equipment.

I. Buried Piping: Install with minimum 36 in. coverage unless otherwise indicated. Lay piping accurately to grade where invert elevations are indicated. When required, provide thrust blocks per manufacturer's recommendations.

J. Equipment and Materials: Install per manufacturer's recommendations.

K. Accessibility: Install work readily accessible for normal operation, reading of instruments, adjustment, service, inspection and repair. Provide access panels where indicated and required.

L. Pipe Joints: Make screwed joints with a minimum amount of compound applied to the male thread only. All joints shall be made per code requirements.
M. Pipe Supports: Support or secure to building construction or firmly anchor waste, vent, and water pipes in such a manner that they cannot be displaced. Use of makeshift devices such as wire, rope, wood, and tape, etc., is prohibited.

3.4 Hangers and Supports

A. Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rests unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Except for buried piping, hang or support pipe runs so that they may expand or contract freely without strain to pipe or equipment.

1. Horizontal steel piping: Provide hangers or supports every 10 ft. except every 8 ft. for piping 1-1/4 in. and smaller.

2. Horizontal copper tubing: For 2 in. diameter and over, provide hangers every 10 ft.; for 1-1/2 in. diameter and smaller, every 6 ft.

3. Horizontal cast-iron hub and spigot piping: Provide hangers or supports at each hub.

4. Horizontal cast-iron no-hub piping: Provide hangers or supports at each side of a no-hub fitting. Provide anti-separation bracing at each 90 degree change of direction.

5. Vertical piping: Support at floor with iron pipe clamps.


B. Branches: Provide separate hangers or supports for branch lines 6 ft. or more in length.

C. Sound and Electrolysis Isolators: Provide at all hangers and supports for hot and cold domestic water lines. Securely attach pipe to walls, studs, etc. All such piping isolated from structure by 1/2 inch felt or “Trisolators”.

3.5 Expansion and Contraction

A. Install piping subject to expansion and contraction with expansion loops made up of bends, fittings, or Victaulic couplings, expansion joints, swing joints, or other approved methods or devices. Branch lines from mains subject to expansion and contraction shall have a swing joint at a point of connection with the main. Risers which pass through one or more floors shall have swing joints at their base. Anchor lines subject to expansion and contraction by approved methods to restrict movement.

3.6 Corrosion Prevention

A. Make joint between cuprous and ferrous materials with approved nylon insulating couplings. Separate contact surfaces of dissimilar metals with non-conducting coating.

3.7 Tests

A. Perform tests to Architect's satisfaction. Make tests in presence of Architect and at a time suitable to him if requested. Furnish necessary labor and equipment and bear costs for testing. Cost of replacing and/or repairing damage resulting therefrom shall be borne by this Contractor. Should the Contractor refuse or neglect to make tests necessary to satisfy the Architect that requirement of specifications and drawings are met, such tests may be made by an independent testing company and the Contractor charged for all expenses.
B. Hydrostatic Tests: Make by completely filling piping system with water and eliminating accumulations of air so that leakage, no matter how small, will be apparent on testing gauge immediately. Maintain pressure until pipe under test has been examined, but in no case less than 24 hours. Test systems at following pressure:

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>TEST PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic cold water</td>
<td>150 psig</td>
</tr>
<tr>
<td>Domestic hot water</td>
<td>150 psig</td>
</tr>
</tbody>
</table>

3.8 Adjusting

A. Upon completion of work and after cleaning of system, fixtures and equipment, and automatic parts of plumbing system shall be carefully adjusted for normal operation. All flush valves and fixture stops shall be checked for proper operation and final adjustments made where required. System shall operate quietly without vibration or noise.

END OF SECTION 15400
SECTION 15800 - Heating, Ventilating and Air Conditioning

PART 1 - General

1.1 General Conditions

A. General Description.

1. Air conditioning for indicated area complete with supply ducts, return air ducts, air distribution equipment and controls.
2. Acceptance and Installation of air conditioning units complete with required supply fans, cooling coils, filters, ductwork, diffusers, grilles, dampers, controls and other items herein specified.
3. Removal of existing ductwork and piping as indicated on the drawings.

1.2 Related Work Included In This Section

A. Furnish electrical devices necessary for mechanical work, except disconnects unless indicated otherwise.
B. Line and low voltage wiring for mechanical controls including final connections.
C. Conduit for line and low voltage wiring for mechanical controls.
D. Responsibility for obtaining clarification of discrepancies between mechanical and electrical work prior to proceeding with the work.
E. Responsibility for proper operation of automatic and/or installed controls and equipment and of electric power driven equipment furnished under this section.
F. Miscellaneous steel for ducts and pipes hangers and supports including structural calculations prepared by a California licensed Structural Engineer.

1.3 Related Work Specified In Other Sections

A. Concrete work including miscellaneous metal in connection with concrete pads under rooftop package units, boiler units, pump and other mechanical equipment. Templates for spacing and sizes of concrete pads and anchor bolts under this section.
B. Electrical work as follows will be provided in Electrical scope description:

1. Conduit for line wiring for equipment and devices as indicated or specified including conduit for line and low voltage wiring for mechanical controls as specified under Division 15.
2. Line wiring for equipment and devices as indicated or specified herein including line and low voltage wiring for mechanical controls as specified under Division 15.
3. Providing disconnect switches.
4. Installing electrical devices such as starters and disconnects, and when indicated, furnishing all such devices.

1.4 Quality Assurance

A. Codes and Standards: In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards:
1. Applicable City regulations and ordinances
6. National Board of Fire Underwriters Publications:
   a. Pamphlet # 70 National Electrical Code
   b. Pamphlet # 90A Air Conditioning Systems

1.5 Submittals

A. Shop Drawings: Before any of the materials of this Section are delivered at the jobsite, submit complete shop drawings. Show all details of all ductwork, piping and equipment pads. The shop drawings shall represent a coordinated set of drawings with other disciplines.

B. Product Data:

   1. Submit copies of all manufacturers product data simultaneously with all shop drawing submittals.
   2. Product data to include all air conditioning equipment, hangers, fans, ductwork construction, piping, and other standard items as required to complement shop drawings for a submittal indicating all products to be used on this work.
   3. Manufacturers and suppliers of equipment shall provide all data necessary for compliance with the State of California Energy Efficiency Code: Compliance certification for all equipment shall be included in equipment submittals.

C. Record Drawings: Maintain throughout the progress of the work project record drawings and submit to the General Contractor at completion of work.

D. Operating Manuals and Maintenance Manuals:

   1. Submit copies of all operating instructions and maintenance manuals.
   2. Fully instruct Owner operating personnel and demonstrate performance, operation and maintenance of equipment for up to 40 hours. Amount of time allocated for said instruction and demonstrations of equipment and systems shall be part of these obligations. Submit a letter to Architect signed by Owner representative who will operate system stating that he is fully instructed by contractor about operation and maintenance of equipment and system.
   3. Submit one additional set of approved instructions and one additional set of approved 11 inch x 17 inch control diagrams suitably framed behind glass for mounting as directed.

1.6 Product Handling

A. Protection: Take all precautions necessary to protect the materials of this section before, during, and after installation.

B. Replacements: In the event of damage, immediately repair or replace all damaged and defective work to the approval of the Architect at no additional cost to Owner.

C. Contractor shall receive owner furnished equipment from manufacturer and take all precautions necessary to protect materials and equipment before, during and after installation.
1.7 Job Conditions
   A. Examination of the Site: Examine the site and include all conditions in bid proposal under which work is to be performed.

1.8 Miscellaneous
   A. Locations and Accessibility: Contractor shall fully inform himself regarding peculiarities and limitations of spaces available for installation of work under this section. Valves, motors, controls and other devices requiring service, maintenance and adjustment shall be placed in fully accessible positions and locations. Provide access doors where required in ductwork or construction whether specially detailed or not, and render all such devices accessible.

   B. Drawings indicate desired location and arrangement of ductwork, piping, equipment and other items, and are to be followed as closely as possible. All offsets and interferences may not be indicated due to the scale of the Drawings. Contractor shall assume responsibility for coordinating work with all other trades and existing conditions. Work specified and not clearly defined by the drawings shall be installed and arranged in a manner satisfactory to Architect. In the event changes in indicated locations and arrangements are deemed necessary by Architect, they shall be made by Contractor without additional charges provided the change is ordered before work is installed and no extra materials are required.

PART 2 - Products

2.1 Pipe Hangers
   A. Hangers shall be complete with threaded steel rods and vibration isolators, seismic restraints sound and electrolysis isolators as required and hereinafter specified. Concrete inserts shall be furnished and installed under this section.

   B. 2-1/2 inches and smaller: Grinnell 104 or approved equal.

   C. 3 inches and larger: Grinnell 260.

   D. Concrete inserts: Grinnell 280.

2.2 Vibration Isolation
   A. Provide vibration isolation equipment for all mechanical equipment and piping as specified herein and indicated on the drawings. The vibration isolation system shall be installed in a manner to prevent the transmission of vibration to the structure. No rigid connections between rotating or oscillating equipment or piping and the building will be permitted.

   B. General Requirements:
      1. Vibration isolation manufacturer shall furnish written instructions covering the installation and adjustment of all isolators. The manufacturer shall replace any isolation that has been improperly sized.
      2. Mechanical subcontractor shall coordinate his work with the other trades. Contractor following him, such as plastering or electrical, shall be notified and instructed to avoid any contact with his installation that would reduce the effectiveness of the system.
      3. Inspections: Vibration isolation manufacturer shall make an inspection of the vibration installation, and inform the Contractor in writing of any necessary corrections and/or adjustments.
4. Bases: Where called for in the specifications and on the drawings, all structural steel bases, including concrete pouring form bases, shall be designed and fabricated by the vibration isolation manufacturer. The concrete for the pouring form bases shall be by others.

5. Vibration isolation shall be manufactured by a single manufacturer. All isolation shall be in strict accordance with the following specifications and manufactured by M.W. Sausse and Co., Inc or Mason Industries. The isolation manufacturer shall include in the submittal the following information:
   a. Type of isolator.
   b. Deflection.
   c. Free or unloaded height.
   d. All physical characteristics of springs used.
   e. Size of structural members.
   f. Efficiency calculations.
   g. Any other pertinent information to make the submittal complete.

C. Technical Requirements:

1. Isolators shall be designed or treated for resistance to corrosion. Structural steel bases shall be cleaned of welding slag and painted with primer and finish coat. All nuts, bolts and washers shall be zinc-electroplated.

2. All equipment shall be equipped with seismic restraints in accordance with the requirements of all governing agencies. These restraints shall be designed and supplied by the vibration isolation manufacturer. Suspended equipment and piping shall be restrained by steel cable. This cable and the method of installation shall be the responsibility of the mechanical contractor. The cable restraints shall be installed in such a manner as to not short circuit the vibration isolation. The Contractor shall submit details for approval.

2.3 Insulation

A. All insulation shall comply with California Code of Regulations, Title 24.

B. Install pipe insulation after piping is installed, tested and approved, and is in clean dry condition. Firmly butt insulation joints.

C. Chilled Water Supply and Return: Insulate piping with glass fiber pipe insulation with factory applied white jacket, Johns Manville Micro-Lok AP, 1-1/2 inch thick. Insulate fittings, flanges and valves with preformed insulation with PVC premolded and piece fitting covers, Johns Manville, Zeston 2000. Adhere longitudinal laps and butt strips of jacket with factory applied pressure sensitive tape system, Johns Manville AP-T. Provide aluminum jacket and aluminum preformed fitting covers, 0.016 inch thick on outdoor piping.

D. Unions: Insulate in same manner as fittings, flanges and valve bodies. Conspicuously mark locations on pipe coverings.

E. Shields: For pipes 4 inches and larger, at each hanger protect insulation with 12 inches long 18 gauge galvanized metal shield over heavy density calcium silicate insulation insert. For pipes 3 inches and smaller, at each hanger protect insulation with 4 inch long 18 gauge galvanized metal shield.
F. Thermal Duct Insulation: Insulate all concealed cold supply air, return air and plenums unless otherwise specified, with Johns Manville Microlite fiberglass duct insulation, wrapped entirely around duct with joints lapped at least 2 inches and secured with 16 gauge galvanized wire on 12 inch centers. Insulation value shall comply with Title 24 requirements. Insulation shall cover all surfaces including standing seams.

G. Exposed Cold Supply Air Ducts: Shall be lined with Johns Manville coated fiberglass duct liner complying with NFPA 90-A requirements. The cut liner shall have an air friction correction factor not greater than 1.1 at a velocity of 3000 fpm. Apply insulation to inside of ducts with an approved fire retardant adhesive to provide 100% coverage and a smooth surface. In ducts with one side more than 12 inches, secure insulation with mechanical fasteners in addition to adhesive, spaced at 14 inch centers in both direction.

H. Mechanical fasteners shall be flush with the liner surface and shall start within 2 inches of the leading edge of each section and within 3 inches of the leading edge of all cross joints within the duct section. All exposed edges and the leading edge of all cross joints of the liner shall be heavily coated with an approved fire resistant adhesive. The duct liner shall be cut to assure snug closing corner joints, the black surface of the liner shall face the air stream, transverse joints shall be neatly butted, and heavily coated with an approved fire resistant adhesive.

I. Contractor’s Option: Concealed main supply air ducts and plenums may be lined in lieu of external wrapping as hereinbefore specified.

J. Lined Duct: Where indicated, line ducts as hereinbefore specified for exposed cold supply air ducts.

2.4 Valves

Valves shall be of same manufacturer or equivalent by comparator chart of approved manufacturer. Provide adapters for valves in copper tubing where necessary. Provide chain operated valves for valves located 7 feet above finished floor in equipment rooms and equipment areas.

A. Balancing Valves:

1. 1-1/4 inches through 2-1/2 inches: 125 lb. SWP, Bell & Gossett circuit setter, bronze, screwed.
2. 2-1/2 inches and larger: Rockwell 175 lb. WWP lubricated semi-steel plug valves with plugs and bolted yokes, operating wrench, with adjustable locking step indicator and arc when balancing cock is used as a shutoff valve.


2.5 Piping Accessories

A. Pressure Gauges: Ashcroft Duragauge 1379-A, complete with 4-1/4 inch diameter dial and gauge cock. One pressure gauge cock and gauge shall be installed on suction and discharge side of each pump and elsewhere indicated to accept a master pressure gauge.

B. Thermometers: Weiss 7VS 3-1/2 inch Vari-Angle adjustable angle red mercury industrial thermometers with 7 inch chrome-plated bronze case, 3-1/2 inch stem with swivel nut, 3/4 inch NPT brass separable socket and etched scale with gradations as indicated or required.

C. Air Vent Valves:

1. Water: 75 psi working pressure. Hoffman No. 79
2. Water: 150 psi working pressure. Hoffman No. 78

D. Flexible Pipe Connections: Braided stainless steel for condenser water piping and braided bronze for hot water systems.

### 2.6 Hydronic Piping

A. Chilled Water Piping:

1. 2 Inches and Smaller: Type L hard-drawn copper tubing, wrought copper fittings with soldered joints.
2. 2-1/2 Inches and above: Schedule 40 black steel pipe with standard welded fittings.

### 2.7 Unions and Gaskets

A. 2 inches and under for steel pipe: Screwed malleable iron, ground joint, 300 lb. WOG Class with brass to iron seat, black.

B. 2-1/2 inches and larger for steel pipe: Cast iron flanged gasket type, conforming to ANSI B16.1, black to suit service, or 150 lb. forged steel slip-on flanges.

C. Unions for copper tubing: Anaconda 1633 or 1733.

D. Dielectric unions: EPCO, complete with isolators and gaskets of same size as pipe, galvanized or black to suit service.

E. Dielectric flanges: F.H. Maloney Co. flanges for cathodic insulation.

F. Gaskets: 1/16 inch Garlock 17022.

### 2.8 Refrigerant Piping

A. Refrigerant piping shall be copper type ACR refrigerant piping with wrought copper fittings.

B. Hot gas and suction refrigerant piping insulation:

1. Insulate piping with glass fiber pipe insulation with factory applied white jacket, Johns Manville, Micro-Lok. Insulate fittings, flanges and valves with pre-formed insulation with PVC pre-molded one piece fitting covers, Johns Manville Zeston 2000. Adhere longitudinal laps and butt strips of jacket with factory applied pressure sensitive tape system Johns Manville AP-T Plus. Provide aluminum jacketing and aluminum preformed fitting covers, 0.016 in thick on outdoor piping.

### 2.9 Dampers

A. Provide balancing volume dampers in each branch duct and in each main duct of constant volume systems to provide for complete air balancing. Fit each manual volume damper with bearings and an adjusting device having a locking mechanism. Provide access panels if concealed or inaccessible through ceiling or wall.

B. Balancing dampers where neither dimension of duct exceeds 17 inches may be job fabricated butterfly type consisting of a blade constructed of 18 gauge galvanized steel securely riveted or welded at its center axis to a square operating rod.
C. Balancing dampers where either dimension exceeds 18 inches shall be Air Balance AC-116, opposed blade type.

2.10 Diffusers, Registers and Grilles

A. Air distribution equipment shall be of sizes and capacities indicated, furnished in factory finished enamel of color selected. Submit paint samples for approval.

B. Square Ceiling Diffusers: Titus model PCS, steel construction with perforated face. Mounting shall be adapted to ceiling suspension system. Use modular face size 24 x 24 inches.

2.11 Server Room A/C Unit

A. The InRoom environmental control system shall be designed specifically for precision temperature and humidity control applications. It will automatically monitor and control heating, cooling and filtering functions for the conditioned space. The system shall be built to the highest quality engineering and manufacturing standards, and shall be floor mounted and configured for up discharge of conditioned airflow, with drawthrough air pattern, to provide uniform air distribution over the entire face of the coil.

1. The system shall be as described in the following specification as manufactured by APC.
2. Submittals shall be provided with the proposal and shall include: capacity data, electrical data, physical data, electrical connection drawing and piping connection drawing.

B. Quality Assurance

1. The system shall be completely factory-tested prior to shipment. Testing shall include, but not be limited to: complete pressure and leak testing to ensure system integrity to include controls calibration and settings. Each system shall ship with a completed test report to verify completion of factory testing procedure. The system shall be ETL/CETL, NTRL listed, MCA, and electrical system shall be UL Listed to UL 1995 and CSA 22.2 No. 236.
2. Contractor shall accept shipment of equipment direct from manufacturer.

C. Warranty

1. 1 year parts without factory start-up and 1 year parts and labor with factory start-up.

D. Cabinet Construction

1. Exterior panels: Shall be 16 gauge steel sheet metal for maximum strength. All exterior panels and frame are powder coated for durability. Front panels shall have removable hinged with a locking handle. The side panels are double wall construction with insulation between. Interior panel wall shall be insulated with 1/2 inch (1.5 lb) density fiber insulation. Insulation shall be completely protected from the air stream by the panel wall or air blocks. Exterior frame and panel color shall have color values: L = 14.02, a = 0.13, b = +3.68. Main bezel color shall have color values: L = 13.44, a = .43, b = -2.63.
2. Frame: Shall be constructed of welded 16 gauge formed steel for maximum strength.
3. All units shall have full service access from the front allowing systems to be placed side by side.

E. Direct Drive Fans

1. EC Fans: Shall be equipped with electronically commutated (EC) fan modules with antivibration mounting to isolate it from the unit structure. The unit shall be configured for drawthrough air pattern, to provide uniform air flow over the entire face of the coil.
F. Refrigeration Components

1. Dual Circuit Refrigeration System: The system shall operate under the coordination of the main controller. Suction and discharge pressures shall be monitored and electronically controllable. Each refrigeration system shall consist of a fully protected scroll compressor, evaporator coil mounted over an anti-fungal, formed plastic condensate drip pan, electronic expansion valve, filter-drier, sight glass, high pressure switch, low pressure switch.

2. Scroll Compressors: The unit shall contain scroll compressors for optimized performance, efficiency and reliability. The heavy-duty scroll compressors shall be designed for year-round usage. Scroll compressors shall have internal safety, ASTP to protect the Scroll Compressor from excessively high discharge temperatures. Compressor crankcase heaters shall be a standard feature for all units with the Scroll Technology.

3. Electronic Expansion Valve: The unit shall contain an electronic expansion valve is used to modulate the amount of refrigerant flow within the system. The EEV shall be constructed of stainless steel with ceramic slide and ports parts for highly accurate flow and mineral wear. EEV has a fast reaction time 1.5 seconds, optimizing saturation of the evaporator coil.

G. Controller

1. Controller: Shall be standard on each unit and provide precision control for the demanding requirements of Mission Critical Environments.

2. Monitoring and Configuration: The display shall allow monitoring and configuration of the precision air conditioning unit through a menu-based control. Functions include status reporting, setup, and temp/humidity set points. Three LED report the operational status of the connected Precision air conditioning unit.

3. Controls: The microprocessor shall come equipped with control keys allowing the user to navigate between menus, to select menu items, and to input alphanumeric information.

4. Alarms: The microprocessor controller shall activate a visible and audible alarm in the occurrence of any of the following events:

   a. High Return Temperature
   b. Low Return Temperature
   c. High Return Humidity
   d. Low Return Humidity
   e. High Filter Differential Pressure
   f. Airflow Failure
   g. Fire/Smoke Alarm
   h. Water detected (optional)
   i. Compressor High Head Pressure 1 & 2
   j. Compressor Low Suction Pressure 1 & 2
   k. High Supply Temperature
   l. Low Supply Temperature
   m. High Supply Humidity
   n. Low Supply Humidity
   o. Condenser Failure
   p. Compressor Failure
   q. External Alarm
   r. Local Stop
   s. Condensate Pump Alarm
   t. Sensor Defect
   u. Sensor Excess
   v. Inlet Water Temperature High
   w. Inlet Water Temperature Low
5. Logging: The microprocessor controller shall log and display the 200 most recent event/alarms. Each alarm log shall contain time/date stamp as well as operating conditions at the time of occurrence. Controller shall display the run time hours for major components (compressors, heaters, humidifier, blower motors).

H. Electrical Panel

1. The control voltage shall be 24 VAC, class 2 circuit. The electrical panel shall contain contactors, starters, overload protection devices, and input power disconnects. The panel shall be located in the front of the unit for available access.

I. Evaporator Coil/Condensate Pan

1. The evaporator coil shall use aluminum fins and rifle-bored copper tubes. Coil end-supports shall be galvanized steel. To enhance dehumidification, the modular system shall utilize dual distributors on one circuit of the refrigeration system. Condensate pan shall be thermal formed, anti-fungal, non-ferrous material for higher indoor air quality.
2. The condensate pan shall have a UL required overflow protection pipe. The overflow piping shall extend from the condensate pan to the base pan of the unit and allow for optional field piping as a gravity drain.

J. Programmable Input/Output Interface Module

1. The unit shall provide field connection through a system programmable input/output module. Each interface module shall be programmable with outputs that can map from any system alarm through the microprocessor controller. Inputs shall be capable of mapping to outputs as a system alarm or custom alarm.

K. Refrigeration System Monitoring

1. The system shall report real time monitoring of both suction and discharge pressures to the controller. Pressures shall be logged and displayed at the proper menu selection on the controls when an alarm condition occurs.

L. Main Power Disconnect

1. A factory installed, main power disconnect switch shall disconnect all high voltage power to the unit. The disconnect switch shall be accessible without removing the electric box cover.

M. Group Control

1. Shall allow up to 16 units to communicate, with each other for redundancy, also demand fighting prevention and mode assist. Global sharing of certain settings, shall require a twisted pair of shielded wiring for interconnection.

N. Network Cable – Redundant Group Control

1. Shall be a twisted pair of shielded wire no longer than 20m between IOC filed installation of wiring is required The cable shall be used to interconnect multiple cooling units in a redundant group, as well as to connect the network management card to an LAN.
O. Network Management Card
   1. The network management card shall permit multi-level access to monitoring, control, and even 
      notification features over the user's network.

P. Additional Programmable Input/Output
   1. The heart of the control system is the I/O controller on which up to 4 EAIO/EDIO boards for 
      additional inputs and outputs. InRoom Controller Manual has a detailed description of inputs and 
      outputs for InRoom configuration.

Q. Evaporator Freeze Protection
   1. Suction pressure shall be actively monitored by two individual sensors and controlled by the 
      microprocessor to calculate the opening of the EEV, eliminating the risk of condensate freezeup 
      on the evaporator.

R. Predictive Failure Warnings
   1. Several components within the unit, such as the compressor, blower, heater and humidifier, shall 
      provide a warning via the microprocessor interface that service is needed prior to failure 
      occurring.

S. Filters 30%
   1. The air filters shall be 30% efficient per ASHRAE Standard 52.1-92, UL Class 2. The full 102 
      mm (4 in) deep, pleated filters shall be replaceable from the front of the unit.

T. High Lift, Single Float Condensate Pump
   1. Shipped loose, field installed and wired condensate pump shall pump 1275 L/s (337 GPH) at 6.09 
      m (20 ft) head. Tank capacity 3.78 L/s (1 USG)

U. Discharge Duct Collar
   1. A 25.4 mm (1 in) duct flange shall be provided for field installation on a unit to provide 
      convenient connection to external ductwork.

V. Smoke Detector
   1. A smoke detector shall be factory installed to sense concentrations of smoke and send a signal to 
      the main controller shutting down the unit and activating a visual and audible alarm.

W. System Specific Features
   1. Air Cooled
      a. The indoor unit shall consist of an evaporator section including evaporator coil, EC fan 
         package, controls, electrical section, and compressor.
2. Condenser
   a. Outdoor Propeller Fan Condenser: The outdoor condenser casing shall be made of aluminum, and all structural supports, coil frame, motor drive supports, and mounting legs shall be made of galvanized steel. The condenser shall have copper tubes expanded into aluminum fins. Headers and connections shall be copper. The coil shall be pressure tested and sealed for shipment. The condenser motors shall have internal overload protection, and operate on 460V, 3ph, 60 Hz power. Motors shall be mounted inside the condenser casing for weather protection, and shall be wired to a terminal strip in a weatherproof panel on the unit. The direct drive, aluminum fan blade and painted steel hub assembly, shall be protected by a heavy-gauge, vinyl-coated, steel-wire fan guard. On multiple units, each fan section shall be separated by fullwidth baffles to prevent bypass air. The condenser shall be sized for 95º F ambient, and condensing temperature controls shall be fan speed for -20º F winter ambient.

3. Multicool
   a. Air systems shall have the option of a chilled water coil that is designed to be the primary cooling source to the backup direct expansion coil. The MultiCool (chilled water) coil shall be constructed with copper tubes and aluminum fins. It shall be located in the return air, before the evaporator coil. The MultiCool coil shall be rated.

2.12 Equals and Substitutions
A. In addition to manufacturers specified, the following shall also be considered equal, providing corresponding models meet specified requirements. Equivalent substituted equipment named herein shall be submitted to Architect for approval. Submit alternate selections at time of bid listing major equipment.

Item: Manufacturer
1. Pipe Hangers & Supports: Fee & Mason, Elcen
2. Vibration Isolation: Mason Industries
3. Insulation: Owens-Corning, Certainteed, Knauf
4. Valves: Nibco, Crane
5. Strainers: Crane, Walworth, Strong, Keckley, Mueller
6. Pressure Gauges: Marsh, Marshalltown, Trerice
7. Thermometers: Palmer, Trerice
8. Dampers: Pottorff, Greenheck
9. Diffusers, Registers, Grilles: Price, Krueger

PART 3 - Execution

3.1 Statement
A. All Heating, ventilation and air conditioning shall be installed in accordance with the requirements of all governing authorities.

3.2 Locations and Accessibility
A. Drawings indicate desired location and arrangement of piping, ductwork, equipment and other items, and are to be followed as closely as possible. All offsets and interferences may not be indicated due to the scale of the Drawings. Coordinate work with all other trades.
B. Valves, motors, controls and other devices requiring service, maintenance and adjustment shall be placed in fully accessible positions and locations. Provide access doors where required in ductwork and construction and render all such devices accessible.

3.3 Equipment Identification

A. All major equipment shall bear firmly attached metal nameplates which state name of manufacturer, model number and electrical data. An additional permanent label shall be affixed to each equipment which will clearly indicate by number which operating and maintenance manual explains maintenance requirements in detail.

B. Valve Identification:

1. Valve tags: Provide tag consisting of 2 inch diameter, 20 gauge, stainless steel or copper disk for each main line shut-off valve or cock. Fasten tags in place with continuous steel ring or chain around stem of valves and around pipe for cock. Disks shall be stamped with service designation with 1/4 inch high letters.

C. Pipe Identification: Mark each individual pipe for quick and easy identification with Idento Bands, aluminum with enamel finish, 1-1/2 inches wide, installed as recommended by manufacturer after completion of piping and finish painting. Unless otherwise specified, coding shall conform to Scheme for the Identification of Piping Systems (ANSI A13.1-1956). Color scheme shall be approved. Base color for markers shall be as follows:

1. Compressed air: Orange
2. Condenser water: Green
3. Space heating hot water: Orange
4. Make-up water: Green
5. Refrigerant piping: Yellow

3.4 Initial Lubrication, Adjusting and Filling Systems

A. Before operating any mechanical systems, equipment bearings shall be lubricated and bolts, pulleys, and other moving parts checked for alignment and tolerances in accordance with manufacturer’s operating instructions. Piping and liquid systems shall be flushed out and filled with operating fluids. After tests, valves and other parts of work shall be adjusted for quiet operation. Strainers shall be cleaned out by removing and washing basket or screen. Compressors shall have lubricating oil changed. Vibrations and noise shall be suppressed.

3.5 Cleaning of Equipment, Materials and Premises

A. Clean equipment and materials thoroughly. Leave surfaces to be painted smooth, clean, and ready for painters. Clean entire premise of unused materials, rubbish, debris, grease spots and dirt left by subcontractors. Remove, clean and replace pipeline strainers after systems have been in operation for a period of 30 calendar days.

3.6 Hangers and Supports

A. Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rests, unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Hang or support pipe runs so they may expand or contract freely without strain to pipe or equipment.
B. Horizontal Steel Piping: Provide hangers or supports every 10 feet except every 8 feet for piping under 1 inch in diameter, unless otherwise specified.

C. Horizontal Copper Tubing: For 2 inch diameter and over, provide hangers, every 10 feet, for 1-1/2 inch diameter and smaller, every 6 feet.

D. Vertical Piping: Support at every floor with wrought iron pipe clamps.

E. Branches: Provide separate hangers or supports for branch lines 6 feet or more in length.

F. Provide seismic restraints as required.

3.7 Equipment and Materials

A. Install per manufacturer’s recommendations.

3.8 Accessibility

A. Install work readily accessible for normal operation, reading of instruments, adjustment, service, inspection and repair. Provide access panels where indicated and required.

3.9 Expansion and Contraction

A. Install piping subject to expansion and contraction with expansion loops made up of bends or fittings, expansion joints, swing joints, or other approved methods or devices. Branch lines from main subject to expansion and contraction shall have a swing joint at point of connection with the main. Risers which pass through one or more floors shall have swing joints at their base. Anchor lines subject to expansion and contraction by approved methods to restrict movement.

3.10 System Balancing

A. Section Includes: Testing, adjusting and balancing of mechanical equipment and systems.

B. Provide and be responsible for protection and repair of adjacent surfaces and areas which may become damaged as a result of Work of this Section. Protect Work hereunder until completion and final acceptance. Repair or replace damaged or defective Work to original specified conditions, at no extra cost to the Owner.

C. All performance testing and balancing of the mechanical systems including:

1. Supply air systems.
2. Return air, fresh air and exhaust air systems.
3. Hydronic systems.

D. Submittals: Submit a complete testing and balancing procedure indicating all test equipment that will be used, testing procedures, test data sheets, systems schematics and points of testing.

1. Test and Balance Data: Submit test and balance data on completion of work under this Section.
2. Certification: Certify in writing that system has been adjusted and balanced and design conditions have been attained.
E. Contractor shall provide to the HVAC Contractor and Electrical Contractor requirements for drive changes, installation of additional dampers, vanes, grille baffles or other items as may be required to balance the system to the Owner’s satisfaction.

F. Verification of Conditions: Prior to testing and balancing, inspect equipment and materials and arrange with HVAC Contractor and Electrical Contractor for satisfactory correction of all defects in workmanship and/or material that could affect the work specified herein.

G. System Operation: Contractor shall coordinate with HVAC specifications and controls specifications and contractors to have all parts of systems in full operation and shall continue the operation of same during each working day of testing and balancing.

H. System testing and balancing shall be performed by an independent agency certified by the Associated Air Balance Council (AABC) or NEBB.

I. All test instruments shall be accurately calibrated and maintained in good working order. Test instruments shall have certification by the manufacturer or by an approved test laboratory within one year of the testing date.

J. Air Distribution Testing and Balancing:
   1. Test and adjust blower RPM to design requirements.
   2. Test and record motor full load amperes.
   3. Make pilot tube transverse of main supply, return, exhaust and outside air ducts and obtain design CFM.
   4. Test and record system static pressures, suction and discharge.
   5. Test and adjust system for design exhaust air CFM.
   6. Test and adjust system for design outside air CFM.
   7. Test and record entering air temperature (D.B. heating and cooling).
   8. Test and record leaving air temperature (W.B. cooling).
   9. Test and record leaving air temperatures (D.B. heating and cooling).
  10. Test and record leaving air temperature (W.B. cooling).
  11. Adjust all supply and return air ducts to proper design CFM.
  12. Test and adjust each diffuser, grille and register to within plus-minus 5% of the amount shown on the drawings.
  13. Each grille, diffuser and register shall be identified as to location and area.
  14. Size, type and manufacturer of diffusers, grilles, registers and all tested equipment shall be identified and listed. Manufacturer’s ratings on all equipment shall be used to make required calculations.
  15. Readings and tests of diffusers, grilles and registers shall include the required FPM velocity and test velocity, required CFM and test result CFM after adjustments.
  16. In cooperation with the control manufacturer’s representative, the setting adjustment of automatically operated controls to operate as specified, indicated and/or noted.
  17. All diffusers, registers and grilles and all equipment shall be adjusted to maintain the design conditions.

K. Hydronic System Balancing: Test, balance and adjust all water systems. Adjust water flows to boilers, pumps, coils, etc., to amounts shown on Drawings. Record following points where applicable to the respective system and any other items necessary to establish that each equipment item is operating properly and at designed capacities and conditions.

   1. A.C. Unit
      a. Water inlet and outlet temperatures.
b. Water inlet and outlet pressures.
c. Water inlet and outlet flows.

L. Coordinate Tests with the manufacturer of each equipment.

M. Witness: Notify Architect in writing two weeks prior to testing and balancing of all major equipment in order to arrange that Architect's representative will witness the tests.

N. Mechanical and balancing contractors shall be responsible for all Title 24 Acceptance testing requirements as indicated on the compliance documentation. Copies of all Acceptance tests shall be included in the air balance report and submitted to the engineer and the owner for record.

3.11 Connection

A. Connections between two dissimilar metal pipes shall be made with dielectric unions.

3.12 Tests

A. Furnish necessary labor and equipment for testing.

B. Hydrostatic Tests: Make by completely filling piping system with water and eliminating accumulations of air so that leakage, no matter how small, will be apparent on testing gauge immediately. Maintain pressure until pipe under test has been examined, but in no case less than 24 hours. Test systems at following pressure:

3.13 Installation

A. Air Cooled condensers and other equipment shall be installed on concrete bases and bolted to vibration isolators and then anchored to structures.

3.14 Discharge Piping

A. Discharge piping shall be extended down from automatic air vents to nearest floor sink.

3.15 Cocks

A. Upon balancing of system, all balancing cocks shall have body plug permanently set to indicate balance position of plug.

3.16 Turning Vanes

A. Turning vanes shall be installed in all right angle sharp turns in ducts.

3.17 Duct Lining

A. Where indicated, specified duct dimensions are net clear dimensions, i.e., clear dimensions, after insulation has been installed.

3.18 Repair or Existing Surfaces

A. Contractor shall provide and be responsible for protection and repair of adjacent existing surfaces and areas that may have been damaged as a result of demolition and new work.
3.19 Capping of Ducts
   A. All existing ducts that are removed and not reused shall be capped airtight and sealed with "miracle" duct sealer and D-617 or equal.

3.20 Ceiling Diffuser Coordination
   A. Contractor shall strictly coordinate all ceiling diffusers and grilles with Mechanical plans. If any discrepancies are encountered, the engineer shall be notified for clarification.

3.21 Thermostat Location
   A. Final location of all thermostats with Owner prior to any installation work.

3.22 As-Built Drawings
   A. Contractor shall provide record as-built drawings to Owner at the completion of tenant construction.

3.23 Smoke Dampers in Ductwork
   A. Maintain net free area equal to duct size at all smoke and fire dampers.
   B. Smoke and fire dampers shall be provided with adequate access doors by this contractor.

3.24 Duct Elbows
   A. Provide minimum duct radius on elbows at one and one half times duct sizes.

3.25 Diffuser Throw Pattern
   A. All ceiling diffusers shown on the plans shall be provided as four way throw unless otherwise noted.

3.26 Ductwork Requirements of UMC
   A. All ductwork shall conform to chapter 6 of the Uniform Mechanical Code.

3.27 Duct and Equipment Requirements of Title 24
   A. All supply air ducts and fire dampers shall be installed per Title 24 regulations.
   B. All mechanical equipment shall be certified by the manufacturer for compliance with Title 24 energy requirements.

3.28 Return Air Plenum Requirements
   A. Return air plenum shall not contain any combustible material.

3.29 Access Requirements
   A. Provide access and clearance requirements per current Mechanical code and manufacturer’s installation instructions whichever is more restrictive.
END OF SECTION 15800
PART 1 – General Electrical Specifications

1.1 Work Included:

A. This specification shall apply to all phases of Work hereinafter specified, shown on Drawings, or as required to provide a complete installation of electrical systems for this Project. Work required under this specification, is not limited to just the Electrical Drawings - refer to Architectural, Structural, Landscape, and Mechanical / Plumbing Drawings, as well as all other drawings applicable to this project, which designate the scope of work to be accomplished. The intent of the Drawings and Specifications is to provide a complete and operable electrical system that includes all documents that are a part of the Contract.

1. Work Included. Furnish labor, material, services and skilled supervision necessary for the construction, erection, installation, connections, testing, and adjustment of all circuits and electrical equipment specified herein, or shown or noted on Drawings, and its delivery to the Owner complete in all respects ready for use.

2. The electrical Work includes installation or connection of certain materials and equipment furnished by others. Verify installation details, installation and rough-in locations from the actual equipment or from the equipment shop drawings.

B. Electrical Drawings. Electrical Drawings are diagrammatic, and are intended to convey the scope of work, indicating intended general arrangement of equipment, conduit and outlets. Follow Drawings in laying out Work and verify spaces for installation of materials and equipment based on actual dimensions of equipment furnished.

1.2 Quality Assurance

A. Design, manufacture, testing and method of installation of all apparatus and materials furnished under requirements of these specifications shall conform to latest publications or standard rules of the following:

- Institute of Electrical and Electronic Engineers - IEEE
- National Electrical Manufacturers' Association - NEMA
- Underwriters' Laboratories, Inc. - UL
- National Fire Protection Association - NFPA
- American Society for Testing and Materials - ASTM
- American National Standards Institute - ANSI
- National Electrical Code - NEC
- National Electrical Safety Code - NESC
- Insulated Cable Engineers Association - ICEA
- American Institute of Steel Construction - AISC
- State and Municipal Codes In Force In The Specific Project Area
- Occupational Safety and Health Administration (OSHA)
- Electronics Industries Association/ Telecommunications Industry Association (EIA/TIA)
- California Electrical Code (where adopted)
- Local Authority Having Jurisdiction (AHJ) Published Electrical Standards and Codes
B. Perform Work in accordance with the National Electrical Code, applicable building ordinances, and other applicable codes, hereinafter referred to as the “Code.” The Contractor shall comply with the Code including local amendments and interpretations without added cost to the Owner. Where Contract Documents exceed minimum requirements, the Contract Documents take precedence. Where code conflicts occur, the most stringent shall apply unless variance is approved.

1. Comply with all requirements for permits, licenses, fees and codes. The Contractor, at Contractor’s expense, shall obtain all permits, licenses, fees, special service costs, inspections and arrangements required for Work under this contract, unless otherwise specified.

2. Comply with requirements of the applicable utility companies serving this Project. Make all arrangements with utility companies for proper coordination of Work.

1.3 General Requirements

A. Guarantee: Furnish a written guarantee for a period of one (1) year from date of acceptance.

B. Wherever a discrepancy in quantity or size of conduit, wire, equipment, devices, circuit breakers, etc., (all materials), arises on the Drawing and/or Specifications, the Contractor shall be responsible for providing and installing all material and services required by the strictest condition noted on Drawings and/or in Specifications to ensure complete and operable systems as required by the Owner and Engineer.

C. All Core Cutting, Drilling, and Patching:

1. For the installation of work under this Section, the aforementioned shall be performed under this Section of the Specifications and the Concrete section of the Specifications.

2. No holes will be allowed in any structural members without the written approval of the Project’s Structural Engineer and review and approval by DSA.

3. For penetrations of concrete slabs or concrete footings, the work shall be as directed in the Concrete Section of Specifications.

4. The Contractor shall be responsible for patching and repairing surfaces where he is required to penetrate for work under this contract.

5. Penetrations shall be sealed to meet the rated integrity of the surface required to be patched and repaired. The patched surface shall be painted or finished to match the existing surface.

D. Verifying Drawings and Job Conditions:

1. This Contractor shall examine all Drawings and Specifications in a manner to be fully cognizant of all work required under this Section.

2. This Contractor shall visit the site and verify existing conditions. Where existing conditions differ from Drawings, adjustment(s) shall be made and allowances included for all necessary equipment to complete all parts of the Drawings and Specifications.

1.4 Work in Cooperation with Other Trades

A. Examine the Drawings and Specifications and determine the work to be performed by the electrical, mechanical and other trades. Provide the type and amount of electrical materials and equipment necessary to place this work in proper operation, completely wired, tested and ready for use. This shall include all conduit, wire, disconnects, relays, and other devices for the required operation sequence of all electrical, mechanical and other systems or equipment.

B. Provide a conduit only system for low voltage wiring required for control of mechanical and plumbing equipment described in this or other parts of the Contract Documents. Install all control housings, conduits and backboxes required for installing conductors and wire to the controls.
C. Install separate conduits between each heating, ventilating and air conditioning sensing device and its control panel and/or control motor. Before installing any conduit for heating, ventilating and air conditioning control wiring, verify the exact requirements from the control diagrams provided with the equipment manufacturer's shop drawings.

1.5 Testing and Adjustment

A. Upon completion of all electrical work, this Contractor shall test all circuits, switches, light fixtures, lighting control & dimming systems including distributed systems, UPSs, Generators, TVSSs, Lighting inverters, Transfer Switches, motors, circuit breakers, motor starters and their auxiliary circuits and any other electrical items to ensure perfect operation of all electrical equipment.

B. Equipment and parts in need of correction and discovered during such testing, shall be immediately repaired or replaced with all new equipment and that part of the system shall then be retested. All such replacement or repair shall be done at no additional cost to the Owner.

C. All circuit(s) shall be tested for continuity and circuit integrity. Adjustments shall be made for circuits not complying with testing criteria.

D. All test reports, including copies of any required Energy Code Acceptance Forms (e.g. CA Title 24 Acceptance for Code Compliance Forms) should be submitted to the Engineer at completion of project.

E. APC equipment to be tested by factory trained representative.

1.6 Identification

A. Nameplates shall be provided for unit substations, switchgear, switchboards, distribution boards, distribution panels, panel boards, motor control centers, transformers, transfer switches, contactors, starters, disconnect switches, enclosed circuit breakers/switches, Inverters, UPSs, PDUs, RDCs, Lighting Control Panels, Dimming Panels, Door Releasing System Panels, Fire Alarm / Central Monitoring terminal cabinets/power supplies/control panels, and all low voltage system terminal & control cabinets. Nameplate inscriptions shall be identical to the equipment designations indicated in plans and specifications.

All circuit breakers/fuses in switchgear, switchboards, distribution boards, distribution panels, UPS output circuit breakers, PDU output circuit breakers and motor control centers shall have individual nameplates located immediately adjacent to the respective device. Nameplate inscription shall identify the downstream equipment or device served by the circuit breaker or fuse.

Nameplates for contactors, starters, disconnect switches, and enclosed circuit breakers shall be engraved with the device designation/identification on the top line, source identification for the device on the 2nd line and load designation for the device on the bottom line. Where device designation is not indicated on plans/specifications, Contractor shall submit a written clarification request to the Engineer.

B. Identification nameplates, UON, shall be laminated 1/8" thick micarta with beveled edges and engraved white letters 3/8" high, minimum, on 1-1/2" high black background for single line of text. Where two lines of text are required, provide min. 2" high nameplate. Where three lines of text are required, provide min. 2.5" high nameplate.

C. Identification nameplates for new switchgear, switchboards, distribution boards, distribution panels, panel boards & motor control centers shall be attached with switchgear manufacturer-provided screws via switchgear manufacturer factory pre-drilled holes. A factory option to rivet identification nameplates to the equipment is only acceptable if screw-fastened nameplates are not an available option from the
switchgear manufacturer. Field drilling or other mechanical attachment methods that change/void the NEMA or NTRL rating of the enclosure are strictly forbidden.

D. Identification nameplates for transformers, transfer switches, disconnect switches, enclosed circuit breakers/switches, Inverters, UPSs, PDUs, RDCs, Lighting Control Panels, Dimming Panels, Door Releasing System Panels, Terminal cabinets and all circuit breakers/fuses in switchgear, switchboards, distribution boards, distribution panels, UPS output circuit breakers, PDUs, PDU output circuit breakers, and motor control centers shall be attached to the equipment by self-adhesive backing integral to the nameplates. When equipment is located outdoors, provide nameplates without self-adhesive backing and attach to equipment using weather-rated, UV-resistant epoxy. In all cases, clean surfaces before applying identification nameplates parallel to equipment lines.

E. Warning Placards, as required by General Single Line Diagram Notes for multiple power sources, or Instruction Placards, as required for all kirk-key interlock schemes, all UPS bypass procedures or as required elsewhere in the plans/specifications shall be self-adhesive, 1/8” thick micarta with beveled edges, engraved 1/2” high white lettering on a Red background. Warning/Instruction Placards shall be attached to the face of the equipment directly related to the placards. Provide a formal placard submittal for review by the Engineer prior to ordering any Warning/Instruction Placards. In all cases, clean surfaces before applying Warning/Instruction Placards parallel to equipment lines.

F. Receptacles that are part of a UL-listed under floor computer room whip assembly, ceiling and/or cable/ladder tray-mounted receptacles used in lab, manufacturing, commercial kitchen environments or that are serving telcom/data/av racks & cabinets shall have identification nameplates located on the wiring device plate cover. Nameplates shall be self-adhesive, 1/8” thick micarta with beveled edges, engraved 1/4” high white lettering on black background with serving power source, circuit identification and NEMA/IEC receptacle type. Use of two (2) separate nameplates per device plate cover is acceptable. Affix nameplates to be visible when plugs are occupying receptacles.

G. See wiring device section of this specification for additional wiring device plate cover labeling requirements.

H. See drawings for panel board schedule directory installation requirements.

I. See conduit installation section of this specification for conduit labeling requirements.

1.7 Final Inspection and Acceptance

A. After all requirements of the Specifications and/or the Drawings have been fully completed, representatives of the Owner will inspect the work. Contractor shall provide competent personnel to demonstrate the operation of any item or system to the full satisfaction of each representative.

B. Final acceptance of the work will be made by the Owner after receipt of approval and recommendation of acceptance from each representative.

1.8 Record Drawings

A. Drawings of Record: The Contractor shall provide and keep up-to-date, a complete record set of drawings. These shall be corrected daily and show every change from the original Drawings. This set of prints shall be kept on the job site and shall be used only as a record set. This shall not be construed as authorization for the Contractor to make changes in the layout without definite instruction in each case. Upon completion of the work, a set of reproducible Contract Drawings shall be obtained from the General Contractor and all changes as noted on the record set of prints shall be incorporated thereon with black ink in a neat, legible, understandable and professional manner. Refer to the Supplementary General Conditions for complete requirements.
1.9 Approvals, Equals, Substitutions, Alternatives, No Known Equal

A. Approvals: Where the words (or similar terms) “approved”, “approval”, “acceptable”, and “acceptance” are used, it shall be understood that acceptance by the Owner, Architect and Engineer are required.

B. Equal: Where the words (or similar terms) “equal”, “approved equal”, “equal to”, “or equal by”, “or equal” and “equivalent” are used, it shall be understood that these words are followed by the expression “in the opinion of the Owner, Architect, and Engineer”. For the purposes of specifying products, the above words shall indicate the same size, made of the same construction materials, manufactured with equivalent life expectancy, having the same aesthetic appearance / style (includes craftsmanship, physical attributes, color and finish), and the same performance.

C. Substitution: For the purposes of specifying products “substitution” shall refer to the submittal of a product not explicitly approved by the construction documents / specifications.

1. Substitutions of specified equipment shall be submitted and received by the Engineer ten (10) days prior to the bid date for review and written approval. Regulatory Agency approval for all substitutions will be the sole responsibility of the Contractor. To receive consideration, requests for substitutions must be accompanied by documentary proof of its equality with the specified material. Documentary proof shall be in letterform and identify the specified values/materials alongside proposed equal values/materials. In addition, catalog brochures and samples, if requested, must be included in the submittal. ONLY PRE-BID APPROVED PRODUCTS, ISSUED VIA A FORMAL BID ADDENDUM TO ALL BIDDERS, WILL BE ALLOWED ON THE PROJECT. REGARDLESS OF THE APPROVAL ON ANY SUBSTITUTION, ALL BIDS SHALL BE BASED ON THE PRODUCTS EXACTLY AS SPECIFIED. PRICING FOR EACH APPROVED SUBSTITUTION SHALL BE INCLUDED IN THE BID SUBMITTAL AS A SEPARATE LINE ITEM.

2. In the event that written authorization is given for a substitution, after award of contract, the Contractor shall submit to the Engineer quotations from suppliers / distributors of both the specified and proposed equal material for price comparison, as well as a verification of delivery dates that conform to the project schedule.

3. In the event of cost reduction, the Owner will be credited with 100 percent of the reduction, arranged by Change Order.

4. The Contractor warrants that substitutions proposed for specified items will fully perform the functions required.

D. Alternates / Alternatives: For the purposes of specifying products, “alternatives / alternates” may be established to enable the Owner / Architect / Engineer to compare costs where alternative materials or methods might be used. An alternate price shall be submitted in addition to the base bid for consideration. If the alternate is deemed acceptable, written authorization will be issued.

E. No Known Equal: For the purposes of specifying products, “No Known Equal” shall mean that the Owner / Architect / Engineer is not aware of an equivalent product. The Contractor will need to submit a “Substitution” item, per the requirements listed above, if a different product is proposed to be utilized.

1.10 Shop Drawings / Submittals

A. Shop Drawings / Submittals shall be submitted in seven (7) bound sets accompanied by Letter of Transmittal, which shall give a list of the number and dates of the drawings submitted. Drawings shall be complete in every respect and bound in sets.

B. The Shop Drawings / Submittals submitted shall be marked with the name of the project, numbered consecutively and bear the approval of the Contractor as evidence that the Contractor has checked the
Drawings. Any Drawings submitted without this approval will be returned to the Contractor for resubmission.

C. If the shop drawings show variations from the requirements of the Contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variations in the Contractor's letter of transmittal. If the substitution is accepted, the Contractor shall be responsible for proper adjustment that may be caused by the substitution. Samples shall be submitted when requested.

Only products listed as “Equal” within the contract documents, along with formally approved “Substitutions” will be reviewed. Products not conforming to these items will not be reviewed and will be returned to the Contractor for re-submittal.

Review comments used in response to shop drawings / submittals are:

- “No Exception Taken” Product approved as submitted.
- “Furnish As Corrected” Re-submittal not required, although the Contractor shall provide the submitted product with corrections as noted.
- “Revise And Resubmit” Re-submittal required with corrections as noted.
- “Rejected” Re-submittal required based upon the originally specified product.

F. Shop drawings shall be submitted on the following but not limited to:

- Lighting Fixtures, Lamps and Ballasts.
- Switchgear, Switchboards, Distribution Boards, Motor Control Centers, Panel boards, and Bus Ducts; complete with overcurrent device information.
- Transformers.
- Fire alarm System/Central Monitoring System.
- Wiring Devices.
- Lighting Control System / Dimming System Products.
- Pullboxes and Underground Vaults
- Terminal Cabinets
- Lighting Inverters, UPSs, RDCs, PDUs, Generators, Transfer Switches, TVSS Systems
- Systems
- Cable Tray, Flexible Cable tray and Cable Runway
- Power Poles and Floor Boxes
- Arc Flash, Short-Circuit & Coordination studies
- All other products called out on drawings that call for shop drawing submittal.

1.11 Maintenance, Serving, Instruction Manuals and Wiring Diagrams

A. Prior to final acceptance of the job, the Electrical Contractor shall furnish to the Owner at least four (4) copies of operating and maintenance and servicing instructions, as well as four (4) complete wiring diagrams for the following items or equipment:

- Fire alarm system.
- Transformers.
- Switchgear, Switchboards, Distribution Boards, Motor Control Centers, Panel boards, and Bus Ducts; complete with over current device information.
- Lighting Inverters, UPSs, PDUs, Generators, Transfer Switches, TVSS Systems

B. All wiring diagrams shall specifically cover the system supplied. Typical drawings will not be accepted. Four (4) copies shall be presented to the Owner.

1.12 Interruption of Service or Service Shutdown:
A. Any interruption of electrical services, electrical circuits, electrical feeders, signal systems, communication systems, fire alarm systems, etc. required to perform work shall meet the specific prior-approval requirements of the Owner. Such work shall be scheduled with the Owner to be performed at the Owner's convenience.

B. Interruptions/outages of any of the Owner’s systems and services mentioned above shall be scheduled to occur during other than the Owner’s normal business hours. Any overtime costs shall be borne by the Contractor.

C. See drawings for any additional requirements regarding outages, interruption and any temporary services required.

PART 2 - Products

2.1 Materials

A. Materials and Equipment: All electrical materials and equipment, including custom-made equipment, shall be new and shall be listed by Underwriter's Laboratories (UL) and bear their label or be listed and certified by a Nationally Recognized Testing Lab (NTRL) that is also recognized by the local Authority-Having-Jurisdiction (AHJ).

B. Switchgear /Switchboards / Distribution Boards / Motor Control Centers:
1. See general single line notes on single line drawing for more information.

C. Panel boards - Branch Circuit:
1. See drawings for panel board schedules and specifications.

D. Transformers:
1. See drawings for transformer schedules and specifications.

E. Lighting Fixtures:
1. See drawings for lighting fixture and lamp schedules and additional specifications. Furnish, install and connect a lighting fixture at each outlet where a lighting fixture type symbol (designated on plans) is shown as being installed. Each fixture shall be complete with all required accessories including sockets, glassware, boxes, spacers, mounting devices, fire rating enclosure and lamps.
2. Ballasts: See lighting fixture schedule notes. All noisy ballasts shall be replaced at no cost to the Owner.
3. Lamps: See lamp / fixture schedule and lamp / lighting fixture schedule notes.

F. Wiring Devices:
1. Provide wiring devices indicated per plan. Devices shall be specification grade. Acceptable manufactures are Leviton, Pass & Seymour and Hubbell. Provide all similar devices of same manufacturer, unless indicated otherwise. All device colors shall be from the full range of manufacturer standard color options as selected by the Architect. This selection will be made during the shop drawing review process.

Wiring Devices (Decora)
Convenience Receptacle #16252- ???
Dedicated Receptacle #16352- ???
Convenience I.G. Receptacle #16262-IG- ????
Dedicated I.G. Receptacle #16362-IG- ???
Convenience G.F.C.I. Receptacle #6599- ???
Dedicated G.F.C.I. Receptacle #6899- ???
Convenience Simplex Receptacle #16251- ???
Dedicated Simplex Receptacle #16351- ???
Recessed Clock Receptacle #5361-CH- ??? (Non-Decora)
Single Pole Switch #5621-2- ???
Double Pole Switch #5622-2- ???
Three Way Switch #5623-2- ???
Four Way Switch #5624-2- ???
Pilot Light Switch “On” #5628-2- ???
Pilot Light Switch “Off” #5631-2- ???
Projection Screen Switch #5657-2- ???
Low Voltage Momentary Switch #5657-2- ???
Keyed Switch #1221-2L- ??? (Non-Decora)
Door Jam Switch #1865- ???

2. I.G. (isolated ground) receptacle bodies shall be of a basic color specified above with an orange triangle to symbolize isolated ground.
3. When shown circuited with an I.G. conductor, receptacles shall be of an I.G. type. As an example, a NEMA L6-30R denoted on the plans and shown circuited with an I.G. conductor shall be an I.G. version of that receptacle.
4. Wiring device cover plates located on recessed boxes shall be commercial grade nylon. Plate color shall match wiring device color u.o.n. on plans. Cover plates utilized on surface mounted boxes shall be metal. Plastic cover plates are unacceptable.
5. All wiring device plates on the project shall be labeled with panel and circuit number(s) utilizing a Brother P-Touch labeling system utilizing 1/2” tape (yellow on black) or equal by Herman-Tellerman or Panduit. Locate label on the concealed side of the wiring device plate. Handwritten labels are unacceptable.
6. The following device plates shall be engraved:
   a. Key operated switches, switches with Pilot Lights and Switches for the control of motors, heaters and ventilators. Engraving shall be black and occur on the exposed side of the plate and indicate the motor, heater, or ventilator controlled.
   b. Receptacles on generator and/or UPS power shall have custom stamped plates with the words “Generator” or “UPS” in black letters.

G. Motor Controllers / Starters: See drawings for motorized equipment schedules and specifications.

H. Circuit Breakers:
1. Service entrance circuit breakers smaller than 400 Amp frame shall be thermal-magnetic trip with inverse time current characteristics unless otherwise indicated below. Service entrance main circuit breakers, 400 Amp frame and larger shall be 100% rated, solid-state type as outlined in this specification. All other service entrance circuit breakers, 400 Amp frame and larger, shall be 100% rated, solid-state type as outlined in this specification.
2. All non-service entrance circuit breakers 225 Amp and larger shall be thermal magnetic type and have continuously adjustable magnetic pick-ups of approximately 5 to 10 times trip rating. Breakers shall have easily changed trip rating plugs with trip ratings as indicated on the Drawings. Rating plugs shall be interlocked so they are not interchangeable between frames. Additionally, all non-service entrance circuit breakers, 600 Amp frame and larger, located in 480v 3 phase, 3-wire or 277/480v, 3 phase 4-wire switchgear, distribution boards or panel boards, shall be solid state, 100% rated. Breaker shall have built-in test points for testing long delay and instantaneous, and ground fault (where shown) functions of the breaker by means of a 120-volt operated test kit.
Contractor shall utilize a test kit capable of testing all breakers 400 Amp and above - at the Engineer’s request.

3. All non-service entrance circuit breakers less than 225 Amp shall be molded plastic case, air circuit breakers conforming to UL 489. Provide breakers with thermal magnetic trip units, and a common trip bar for two- or three-pole breakers, connected internally to each pole so tripping of one pole will automatically trip all poles of each breaker. Provide breakers of trip-free and trip-indicating bolt-on type, with quick-make, quick-break contacts. Provide single two- or three-pole breaker interchangeability. Provide padlocking device for circuit breakers as shown on the Drawings.

4. Where a Current Limiting Circuit Breaker (CLCB) is indicated on drawings or as required elsewhere in this specification, provide a U.L. listed current limiting thermal magnetic circuit breaker(s) u.o.n. An independently operating limiter section within a molded case is not allowed. Coordinate CLCB ratings as required to protect electrical system components on the load side of the CLCB to include, but not limited to, protecting automatic transfer switches, panel boards and lighting control panels.

5. Where a solid-state circuit breaker is indicated on drawings or as required elsewhere in this specification, provide a solid-state circuit breaker with minimum five function complete with built-in current transformers. The five functions shall be independently adjustable and consist of Overload/Long Time Amp Rating, Long Time Delay, Short Time Delay, Short Circuit/Instantaneous Pickup, but may also include Shunt Trip and/or Ground Fault if so indicated on the Drawings. Rating plugs shall be interlocked so they are not interchangeable between frames. Breaker shall have built-in test points for testing long delay and instantaneous, and ground fault (where shown) functions of the breaker by means of a 120-volt operated test kit. Contractor shall utilize a test kit capable of testing all breakers 400 Amp and above - at the Engineer’s request.

6. Ground Fault Interrupting Breakers. Provide with molded plastic case, air circuit breakers, similar to above with ground fault circuit interrupt capability, conforming to UL Class A, Group 1.

7. Arc Fault Interrupting Breakers. Provide with molded plastic case, air circuit breakers, similar to above with arc fault circuit interrupt capability, conforming to UL 1699 & UL Class A, Group 1. Provide on all-dwelling unit circuits supplying bedrooms, sleeping quarters etc as required to comply with NEC, or CEC where adopted, Article 210.12(B).

8. Series Rated Breakers. UL listed series rated combinations of breakers can be used to obtain panelboard-interrupting ratings shown on Drawings. If series rated breakers are used, switchboards, distribution boards and panel boards shall be appropriately labeled to indicate the use of series rated breakers. Shop drawing submittal shall include chart of U.L. listed devices, which coordinate to provide series rating.

9. Tandem or half-sized circuit breakers are not permitted.

10. Circuit breakers shall be standard interrupting construction. Panelboard shall accept standard circuit breakers up to 225 amperes.

11. Circuit breaker handle accessories shall provide provisions for locking handle in the on or off position.

12. Shunt trip equipped circuit breakers shall be provided on all elevator feeders.

13. Temperature compensating circuit breaker(s) shall be provided when located in outdoor enclosure(s) or when located in an enclosure subject to high ambient heat due to nearby industrial processes etc.

14. Provide 75 degree Celsius-rated conductor lugs/lug kits as required on all circuit breakers to accept conductor quantities and sizes shown on drawings.

15. All circuit breaker terminations shall be suitable for use with 75 degrees Celsius ampacity conductors.

I. Disconnect Switches:
1. Non-fusible or fusible, heavy-duty, externally operated horsepower-rated, 600V A.C. Provide NEMA 3R, lockable enclosures for all switches located on rooftops, in wet or damp areas and in any area exposed to the elements.

2. Fusible switches shall be Class “R”.

3. Amperage, Horsepower, Voltage and number of poles per drawings- all of which shall be clearly marked on the switch nameplate.

4. Provide the Owner’s project manager with one (1) spare set of fuses and two (2) sets of fuse clips/fuses for every set of fuses on the project.

J. Fuses:

1. Provide fuses at all locations shown on the Drawings and as required for supplemental protection.
   a. Fuses shall be manufactured by Bussman, Shawmut, or equal.
   b. All fuses shall be the product of a single manufacturer.

2. Main and Feeder Protection.
   a. Where rating of protective device is greater than 600A, provide Bussman Hi-Cap fuses, Class L, current limiting, having an interrupting rating of 200,000A RMS.
   b. Where rating of protective device is 600A or less, provide Bussman Class RK series current limiting fuses, having an interrupting rating of 200,000A RMS.

   a. Where rating of protective device is greater than 600A, provide Bussman Hi-Cap fuses, Class L, current limiting, having an interrupting rating of 200,000A RMS.
   b. Where rating of protective device is 600A or less, provide Bussman Class RK series current limiting fuses, having an interrupting rating of 200,000A RMS.
   c. Where fuses feeding motors are indicated but not sized, it shall be the responsibility of the Contractor shall coordinate the fuse size with the motor to provide proper motor running protection.
   d. When rejection type fuses are specified (Class RK series) the fuse holder of all switches (specified in other Sections) shall be suitable for the fuses provided.

K. Cable Tray, Flexible Cable Tray and/or Cable Runway:

1. See drawings for Cable Tray, Flexible Cable Tray and/or Cable Runway specifications.

L. Uninterruptible Power Systems (UPS):

1. See drawings for UPS schedules and specifications.

M. Power Distribution Units (PDU):

1. See drawings for PDU schedules and specifications.

N. Generator Systems:

1. See drawings for Generator schedules and specifications.

O. Transfer Switches:

1. See drawings for Transfer Switch schedules and specifications.

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P. Lighting Control / Dimming Systems:

1. See drawings for lighting Control and/or Dimming Systems schedules and specifications.
2. Wall box dimmers shall be rocker-type as manufactured by Lutron - no known equal. Dimmers and dimmer faceplates shall match the color of adjacent switches and faceplates. Dimmers and dimmer faceplates in wood finished areas shall generally be black unless otherwise indicated by the Architect. The Contractor shall obtain written approval of the Architect regarding final dimmer and dimmer faceplate color selection prior to ordering material. Multiple dimmers/switches shall be ganged together with a common cover plate. Provide dimmers as follows:

   a. Incandescent: Lutron DIVA DV-10P or DV-103P (3-way) (1000 Watt max.)
   b. Electronic Low Voltage: Lutron DIVA DVELV-300P or DVELV-303P (3-way) (300 Watt)
   c. Magnetic Low Voltage: Lutron DIVA DVLV-10P or DVLV-303P (3-way) (800 Watt max.)
   d. Fluorescent (3-Wire): Lutron DIVA DVF-103P (single/3way, 8A @ 120v) or DVF-103P-277 (single/3way, 6A @ 277v)
   e. Fluorescent (0-10V): Lutron DIVA MW-DV.
   g. Fan Control: Lutron DIVA DVFSQ-F (1.5A @ 120V, max, 3 speed, single pole, 3-way)

Contractor shall verify if dimmer(s) requires derating when ganged. Provide Lutron H.P. module, Lutron Power Boosters, and/or Lutron Interfaces where required to accommodate loads higher than dimmers' standard or derated load carrying capacity.

Q. Fire Alarm System/Central Monitoring System:

1. See drawings for Fire Alarm System or Central Monitoring System specifications.

R. Transient Voltage Suppression TVSS:

1. See drawings for TVSS specifications.

S. Conduit:

1. Galvanized Rigid Conduit (GRC) shall be full weight threaded type steel. Steel conduit shall be protected by overall zinc coating to inside and outside surfaces, applied by the hot dip, metallizing, or sherardizing process.
2. Intermediate Metal Conduit (IMC), shall be hot-dipped galvanized in accordance with UL 1242 and meeting Federal Specification WWC-581 (latest revision).
3. Electrical Metallic Tubing (EMT) shall be zinc-coated steel with baked enamel or plastic finish on inside surfaces. EMT shall be dipped in a chromic acid bath to chemically form a corrosion-resistant protective coating of zinc chromate over galvanized surface.
4. Flexible metal conduit shall be constructed of aluminum or hot-dipped galvanized steel strips wound spirally with interlocking edges to provide greatest flexibility with maximum strength. Interior surfaces shall be smooth and offer minimum drag to pulling in conductors. Use only as directed in writing by the Engineer with the exception of 400 Hz feeders and 400 Hz branch circuits which shall be run in flexible aluminum conduit.
5. Liquid-tight conduit (Seal-Tite) shall be galvanized steel flexible conduit as above except with moisture and oil-proof jacket, pre-cut lengths and factory-installed fittings. For outdoor installations and motor connections only unless otherwise noted on drawings.
6. Factory assembled, or off-site assembled wiring systems (such as Metal Clad (MC) Cable, Type AC Cable, Type NM Cable, Type BX Cable, etc…) shall not be used unless otherwise indicated in
the Allowed Specification Deviations Section or Deductive/Additive Alternate Pricing Section generally located on the symbols list drawing.

7. When approved for use in the Allowed Specification Deviations Section, generally located on the symbols list drawing, MC cables shall be allowed for lighting branch circuits (homeruns shall be EMT), receptacle branch circuits (homeruns shall be EMT) and poke-thru fed systems furniture homeruns. MC shall not be used where exposed, except for a maximum 6’ length for final connections to light fixtures, or terminate in electrical panelboards or distribution boards. Equipment ground conductor shall be green. Isolated ground conductor shall be green with yellow stripe. Provide 600V rated aluminum or lightweight steel interlocking armor Metal Clad (MC) cable with copper conductors, THHN (90 degree C) insulation, and integral equipment grounding conductor and isolated grounding conductor as required. Type AC cable listed for use in patient care areas per NEC or CEC where adopted, Article 517.13 shall be required in such areas in lieu of MC cable. MC cable shall be manufactured to UL Standard 1569. See Execution section of this specification for additional installation requirements.

8. Nonmetallic Flexible Tubing (ENT) shall not be used unless otherwise indicated in the Allowed Specification Deviations Section or Deductive/Additive Alternate Pricing Section generally located on the symbols list drawing. Use of ENT, if allowed, is strictly limited to use in CMU walls and parking structures decks or as directed in writing by the Engineer. See Execution section of this specification for additional installation requirements.

9. Non-Metallic Conduit:
   a. Polyvinyl chloride (PVC) rigid conduit, Schedule 40, Type II for underground installation only with solvent welded joints, conforming to Underwriters Laboratories, Inc. (U.L.) requirements, listed for exposed and direct burial application.
   b. Conduit and fittings shall be produced by the same manufacturer.

10. Fire-rated MC Cable:
   a. 2-hour fire-rated, polymer insulated 600V MC cable listed and conforming to Underwriters Laboratories, Inc. (UL) 2196 & UL 1569 requirements for installation as an Electrical Circuit Protective System for use in complying with NEC, or CEC where adopted, Articles 695 and 700. Cable sheath shall be suitable for use as a NEC or CEC where adopted, equipment grounding conductor and shall be listed for use in wet locations to 90 degrees C. (Raychem or equal).
   b. Cable connectors shall be brass MC connectors.

T. Fittings:

1. Conduit type fittings shall be smooth inside and out, taper threaded with integral insulating bushing and of the shapes, sizes and types required to facilitate installation or removal of wires and cables from the conduit and tubing system. These fitting shall be of metal, smooth inside and out, thoroughly galvanized, and sherardized cadmium plated.
2. Metallic conduit covers shall have the same finish as the fitting and shall be provided for the opening of each fitting where conductors do not pass through the cover.
3. Connector, coupling, locknut, bushings and caps used with rigid conduit shall be steel, threaded and thoroughly galvanized. Bushings shall be insulated.
4. U.O.N. all EMT fittings, connectors and couplings installed in concealed locations, areas not considered to be wet or damp locations by the AHJ, or areas not subject to physical damage, shall be steel, zinc or cadmium plated, threadless, compression, steel locking ring type with insulated throat. Where suitable for use, steel set screw fittings are allowed for trades sizes of 2” and smaller. Insulated throat is not required for fittings, connectors and couplings 1” and smaller.
5. All interior and exterior EMT fittings, connectors and couplings, 2” and smaller, installed in exposed or concealed locations that are considered by the AHJ to be wet or damp locations, shall be rainite-listed, steel zinc or cadmium plated, threadless, compression, steel locking ring type
with insulated throat. If raintite-listed, steel, zinc or cadmium plated, threadless, compression, steel locking ring type with insulated throat. If raintite-listed, EMT fittings, connectors and couplings are unavailable for a given trade size or if conduit is installed in an area subject to damage – provide rigid metallic or intermediate metallic conduits, fittings, connectors and couplings as required.

6. Flexible steel conduit connectors shall be a malleable iron clamp or squeeze type or steel twist-in type with insulated throat. The finish shall be zinc or cadmium plating.

7. Conduit unions shall be "Erickson" couplings, or approved equal. The use of running threads will not be permitted.

U. 600 Volt Conductors - Wire and Cable:

1. All conductors shall be copper. Provide stranded conductor for #10 AWG and larger or when making flexible connections to vibrating machinery. Use compression "fork" type connectors or transition to solid conductors when connecting to switches, receptacles, etc.

2. Type THHN/THWN-2 thermoplastic, 600 volt, UL approved, dry and wet locations rated at 90 degrees Celsius, for conductors of all sizes from #12 AWG up to and including 1000 kcmil. RHH/RHW insulation is allowed only to provide an Electrical Circuit Protective System to comply with NEC, or CEC where adopted, Articles 695 and 700.

3. Wire and cable shall be new, manufactured not more than six (6) months prior to installation, shall have size, type of insulation, voltage rating and manufacturer's name permanently marked on outer covering at regular intervals.

4. Wire and cable shall be factory color-coded by integral pigmentation with a separate color for each phase and neutral. Each system shall be color-coded and it shall be maintained throughout.

5. Systems Conductor Color Coding:

a. Power 208/120V, 3PH, 4W:

   (1) Phase A = Black
   (2) Phase B = Red
   (3) Phase C = Blue
   (4) Neutral = White
   (5) Switchlegs = Purple (Switchlegs shall also be identified separately by numerical tags).
   (6) Travelers = Purple with Black stripe.

b. Power 480/277V, 3PH, 4W:

   (1) Phase A = Brown
   (2) Phase B = Orange
   (3) Phase C = Yellow
   (4) Neutral = Grey
   (5) Switchlegs = Purple (Switchlegs shall also be identified separately by numerical tags).
   (6) Travelers = Purple with black stripe.

c. Ground Conductors: Green
d. Isolated Ground Conductors: Green with continuous yellow stripe.
e. Fire Alarm System: As recommended by the manufacturer.

6. All color-coding for #12 thru #6 AWG conductor shall be as identified above. Conductors #4 AWG and larger shall be identified with utilizing phase tape at each termination.

7. No conductors carrying 120 volt or more shall be smaller than #12 AWG.

8. Aluminum conductors shall not be used.

9. Wire-pulling compounds used as lubricants in installing conductors in raceways shall only be "Polywater J". No oil, grease, graphite, or similar substances may be used. Pulling of #1/0 or
larger conductors shall be done with an approved cable pull machine. Other methods; e.g. using vehicles and block and tackle to install conductors are not acceptable.

V. Medium Voltage Conductors (greater than 600V):
   1. See drawings for Medium Voltage Cable Schedule & Specifications.

W. Junction and Pullboxes:
   1. For interior dry locations, boxes shall be galvanized one-piece drawn steel, knockout type, with removable, machine screw secured covers.
   2. For outside, damp or surface locations, boxes shall be heavy cast aluminum or cast iron with removable, gasketed, non-ferrous machine screw secured covers.
   3. All boxes shall be sized for the number and sizes of conductors and conduits entering the box and equipped with plaster rings where required.

X. Outlet Boxes:
   1. For fixtures, boxes shall be galvanized, one-piece drawn steel, knockout type equipped with 3/8" fixture studs and plaster rings where required.
   2. For convenience outlets, wall switches, or other devices, outlet boxes shall be galvanized one-piece drawn steel, knockout type 4" x 4"x 1-1/2" minimum size with plaster rings as required.
   3. For locations where standard boxes are not suitable due to number and size of conduit to be terminated, special boxes shall be designed to fit space or meet other requirements and submitted for approval.
   4. For exposure to weather, damp locations, or surface mounting, outlet boxes shall be heavy cast aluminum or cast iron with threaded hubs; covers shall be watertight with gaskets and non-ferrous screws.
   5. See drawings for floor box installation notes and specifications.

Y. Plywood Backboards: Where indicated for telephone or communications system terminals or other equipment assemblies, provide backboards of size indicated. Use 3/4" thick x 8' tall (length per plans), Douglas Fir, void-free, kiln-dried, fire-rated plywood finished on one side and prime coat painted on all surfaces with finish coat of enamel paint, color by Architect. Leave one (1) fire-rating stamp/sheet exposed for inspection.

Z. Terminal Cabinets:
   1. Terminal cabinets shall be fabricated of hot dipped galvanized code gauge sheet metal for flush or surface mounting, complete with barriered sections, a door for each vertically barriered section and sizes as indicated on plan. Doors shall be hinged and lockable. Locks shall be keyed to match the branch circuit panelboards. Terminal cabinet trims shall match the branch circuit panels.
   2. Provide each terminal cabinet with a full size plywood backboard.
   3. Terminal cabinets shall be installed complete with full-length skirts of the same construction and finish as the terminal cabinet.
   4. Where mounted outdoors, terminal cabinets shall be NEMA 3R, weatherproof complete with gaskets and required sealant to prevent moisture from entering the terminal cabinet.
   5. All terminal cabinets and terminal cabinet barriered sections shall be labeled by the cabinet or cabinet section use (i.e. CATV, Security, etc). Labels shall be Micarta type as specified elsewhere in these specifications. Unless otherwise noted, all termination blocks and cables shall be labeled per ANSI/EIA 606 standard.
AA. Painting: Terminal cabinets, panels, junction boxes, pull boxes, etc., and conduit installed in public view shall be painted with colors selected by the Architect to match the subject surface. Refer to painting section of the specifications for additional requirements.

BB. Seismic Design and Anchoring of Electrical Equipment:

1. Seismic Protection Criteria: All Electrical and Mechanical machinery installations provided, as part of this contract located in any Seismic Risk Zone of the Uniform Building Code Seismic Risk Map shall be protected from earthquakes in accordance with the International Building Code and, as applicable, the state and local building codes and regulations. Protection criteria for these zones shall be a Horizontal Force Factor as prescribed by the IBC, or locally adopted building codes, multiplied by the machinery weight considered passing through the machinery center of gravity in any horizontal direction. Unless vibration isolation is required to protect machinery against unacceptable structure transmitted noise and/or vibration, machinery shall be protected from earthquakes by rigid structurally sound attachment to the load supporting structure. The force factor and anchorage shall be determined by calculations performed and submitted to the Architect by a professional engineer registered in state where the work is being performed (civil or structural) hired by the Contractor. The Contractor shall be responsible for the design of seismic restraint systems for all pieces of equipment weighing over 50 pounds including but not limited to the following:
   b. Conduits/Conduit support trapezes
   c. Transformers
   d. Light Fixtures
   e. Inverters, UPSs, RDCs, PDUs, Generators, Transfer Switches
   f. Cable Tray, Flexible Cable Tray, Ladder Tray
   g. Bus Duct

2. Seismic protection, labor, materials and design shall be included in the Contract sum.

CC. Trenching and Backfilling: Contractor shall be responsible for trenching and backfilling. Refer to Trenching and Backfilling section of the specifications for complete requirements.

PART 3 - Execution

3.1 Preparation and Installation

A. Installation of Conduit and Outlet Boxes:

1. All conduit installed in the dry walls or ceilings of a building shall be steel tube (EMT), aluminum tube (EMT), or Intermediate Metal Conduit (IMC). Flexible conduit shall not be used in lieu of EMT, IMC or rigid conduit except as noted herein.

2. Galvanized rigid conduit (GRC) or intermediate metal conduit (IMC) shall be used as follows:
   - when noted on the drawings.
   - when considered exposed to damage by the local AHJ.
   - when installed in wet or damp locations and of a trade size where listed-raftite fittings, connectors, couplings etc. are unavailable.
   - when required by NEC or CEC Article 517.13.
   - when installed in concrete and masonry. The use of ENT in CMU walls and parking structures may be allowed only as directed in writing by the Engineer. Request for ENT
substitution must be made prior to bid and in accordance with pre-bid substitution requests requirements of these specifications.

3. Intermediate metal conduit (IMC), is approved for use in all locations as approved for GRC or EMT and in accordance with NEC, or CEC where adopted, Article 342.

4. Flexible steel conduit shall only be permitted to be used at light fixture outlets and connections to vibrating electrical equipment. All flexible steel conduit runs shall be less than 6'-0". All outdoor installation shall be made using liquid-tight flex with approved fittings. Include a separate insulated green ground conductor sized per NEC in each conduit. Other uses of flexible conduit shall be allowed only as approved in writing by the Engineer.

5. Flexible liquidtight conduit shall be installed in lieu of the flexible steel, where required by the NEC, or CEC where adopted, in damp and wet location, where exposed to weather, in refrigerated area (65°F or less), and/or between seismic joints. All rotating electrical equipment shall be supplied with flexible, liquid-tight conduit with appropriate slack and shall not exceed thirty-six (36) inches. Include a separate insulated green ground conductor sized per NEC in each conduit. Other uses of liquidtight flexible conduit shall be allowed as approved in writing by the Engineer on a case by case basis.

6. Where required for providing an Electrical Circuit Protective System to comply with NEC, or CEC where adopted, Articles 695 and 700, utilize UL listed 2-hour fire-rated, MC cable or UL listed 2-hour fire-rated RHH-RHW conductors in conduit.

7. Conduit shall be run so as not to interfere with other piping fixtures or equipment.

8. The ends of all conduits shall be cut square, carefully reamed out to full size and shall be shouldered in fitting.

9. No running threads will be permitted in locations exposed to the weather, in concrete or underground. Special union fittings shall be used in these locations.

10. Where conduit is underground, under slabs or grade, exposed to the weather, or in wet locations, make joints liquid tight and gas tight.

11. All metal conduit in masonry and concrete and where concealed under floor slabs shall have joints painted with thread compound prior to makeup.

12. PVC conduit shall not be run in walls.

13. Where conductors enter a raceway or a raceway in a cabinet, pull box, junction box, or auxiliary gutter, the conductors shall be protected by a plastic bushing type fitting providing a smoothly rounded insulating surface.

14. Where conduit extends through roof to equipment on roof area, this Contractor shall provide flashing material compatible with the roofing system as required by the roofing specifications or as required by the Owner’s roof warranty. This flashing shall be delivered to the roofing contractor for installation. The actual location of all such roof penetrations and outlets shall be verified by the Architect/Owner. Contractor shall verify type of flashing prior to bid and include all costs.

15. All conduit shall be supported at intervals not less than 6'-0" and within 12" from any outlet and at each side of bends and elbows. Conduit supports shall be galvanized, heavy stamped, two-hole conduit clamp properly secured.

16. Where conduit racks are used the rack shall consist of two piece conduit clamps attached to galvanized steel slotted channels, properly secured via threaded rods attached directly to the building structure.

17. Nail-in conduit supports, one-piece set screw type conduit clamps or perforated iron for supporting conduit shall not be used.

18. Seismic Conduit Support:

a. All conduit shall be supported in such a manner that it is securely attached to the structure of the building. Attachment is to be capable of supporting the tributary weight of conduit and contents in any direction. Maximum spacing of support and braces are to be as follows:

<table>
<thead>
<tr>
<th>CONDUIT SIZE</th>
<th>MAXIMUM SPACING</th>
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19. All conduit runs shall be installed parallel or perpendicular to walls, structural members, or intersection of vertical planes and ceilings. Field made bends and offset shall be avoided where possible. Crushed or deformed raceway shall not be installed.

20. Open knockouts in outlet boxes only where required for inserting conduit.

21. Locate wall outlet of the same type at same level in all rooms, except where otherwise noted.

22. Outlet boxes on metal studs shall be attached to metal hangers, tack welded or bolted to studs; on wood studs attachment shall be with wood screws, nails not acceptable.

23. Recessed boxes shall not be mounted back-to-back in any wall; minimum offset shall be 24 inches.

24. Junction Boxes that do not contain any device(s) shall be located in storage rooms, electrical closets, or above accessible ceilings, not in hard lid ceilings or other forms of inaccessible ceilings. Place boxes which must be exposed to public view in a location approved by the Owner’s Project Manager. Provide covers or plates to match adjacent surfaces as approved by the Owner’s Project manager.

25. Surface mounted pull boxes, terminal cabinets, junction boxes, panel boards etc., shall be attached to walls using appropriate screws, fasteners, backing plates, stud blocking etc., as detailed on Architectural and/or Structural drawings. If architectural and/or Structural drawings are not provided on the Project, Contractor shall provide all necessary mounting hardware and backing support to comply with local building code requirements and any additional requirements imposed by the local Authority-Having-Jurisdiction.

26. Except where below grade, sleeves shall be installed where conduit passes through masonry or concrete walls and shall be 24 gauge galvanized steel no more that 1/2" greater in diameter than the outside diameter of the conduit. When located in non-rated structures, caulk conduit sleeve with stone wool. When located in fire rated structures, provide U.L. listed fire stopping system. See fire stopping section of this specification for additional requirements.

27. All boxes shall be covered with outlet box protector, Appleton SB-CK, or similar device / method to keep dirt / debris from entering box, conduit or panels. If dirt / debris does get in, it shall be removed prior to pulling wires.

28. All boxes installed outdoors shall be suitable for outdoor installations, gasketed, screw cover and painted as directed by the Architect with weatherproof paint to match building.

29. All conduit entries to outdoor mounted panels, cabinets, boxes, etc., shall be made using Myers "SCRU-TITE" hubs Series ST.

30. Provide nylon or a 1/8-inch O.D. polyethylene rope, rated at 250 pounds tensile strength, in all conduits more than 5 feet in length left empty for future use. Not less than 5 feet of rope shall be left at each end of the conduit. Tag all lines with a plastic tag at each end indicating the termination/stub location of the opposite end of the conduit.

31. All multiple conduit runs within suspended ceilings shall be suspended from building structure by means of unistrut hangers/racks, Conduit shall not be allowed to lay on ceiling or be supported from ceiling suspension wires or other suspension system. Support conduit to structure above suspended ceilings 8" minimum above ceiling to allow removal of ceiling tile. Maintain two-inch clearance above recessed light fixtures.

32. All exposed conduits and support hardware shall be painted to match the finish of the wall or ceiling to which it is supported.

33. Seal all conduits where termination is subject to moisture or where conduit penetrates exterior wall, floor or roof, in refrigerated areas, classified (hazardous areas) and as indicated on the drawings.

34. Except as otherwise indicated on the Drawings or elsewhere in these specifications, bends in feeder and branch circuit conduit 2 inches or larger shall have a radius or curvature of the inner edge, equal to not less than ten (10) times the internal diameter of the conduit. Except where sweeping vertically into a building where sweep radius equals ten (10) times conduit diameter, underground communications and building interconnect conduits 3 inches or larger shall have a
35. Tag all empty conduits at each accessible end with a permanent tag identifying the purpose of the conduit, footage end-to-end, and the location of the other end. In wet, corrosive outdoor or underground locations, use brass, bronze, or copper 16 gauge tags secured to conduit ends with #16 or larger galvanized wire. Inscribe on the tags, with steel punch dies, clear and complete identifying information.

36. Installation of Metal Clad (MC) Cable (when use is permitted in the Allowed Specification Deviations Section generally located on the symbols list drawing).

   a. Provide J-box above accessible ceiling prior to running MC cable within partitions or walls. J-box shall be permanently labeled with panel identification and circuit numbers contained within.

   b. Overhead MC cable runs shall generally follow building lines to provide a neat and workmanlike installation.

   c. Provide code-sized j-boxes to accommodate MC cable splicing in general. For systems furniture poke-thrus feeds utilizing MC cable, transition from MC cables to conduit and wire near the panelboard in the TI accessible ceiling space on the floor below the panel board via code-sized gutter(s). Utilize UL listed, insulated barrier strips with recessed screw heads (Ideal #89-6?? Series or equal) fastened within the gutter(s), terminate MC conductors on one side of the strips(s) and individual conductors in conduit from the panelboard(s) on the other side of the strip(s). Label each terminal strip(s) with panel designation. Label each phase conductor with circuit number using wire markers (Ideal or equal). Wire nuts are not an acceptable alternative to the terminal strips in these underfloor transition locations. Provide (1) spare 3/4” conduit from each gutter to its respective panelboard.

   d. MC cable shall not run directly into panelboards, distribution boards or electrical rooms.

   e. MC cabling shall be provided with its own code-approved ceiling support wires, cable hangers, individual spring steel support clips, steel trapeze hangers, threaded rods or dedicated #10 AWG drop wire. Cable supports shall be fastened to concrete slabs, beams, joists or other structural members of the building. In no case shall MC cable rest on ceilings, suspended ceilings or structures. Do not support MC cable using ceiling support wires. The use of nylon cable ties to support MC cable is not allowed.

   f. Use lock or spring nut MC cable fittings.

   g. Cable runs shall be continuous from wiring device to wiring device – no intermediate splicing j-boxes allowed.

   h. When terminating or splicing at a junction, outlet, or switch box, cut the cable with an armored cable rotary cutter such that 6-inches of free conductors remain for connections or splices. Use screw-in or spring lock connector and ensure a proper bonding by firmly tightening the connector to both the box and cable. Insert an anti-short bushing at cable ends to protect conductors from abrasion and use insulated connectors.

   i. MC cable bend radius shall not be less than seven (7) times the external diameter of the cable.

   j. MC cables passing through fire-rated walls or floors shall be firestopped as required with a UL listed system. See firestopping requirements outlined elsewhere in this specification for additional requirements.

   k. Installation shall not exceed code requirements for total current carrying conductors in multiple MC cable runs bundled together into a single MC cable hanger or strap, unless support device is specifically listed for such purpose. Neutrals shall be counted as current carrying conductors.

   l. Maintain MC cable clearance of at least 6 inches from hot water and any other high temperature pipes. Maintain at least 12-inches clearance between MC cable(s) and telecommunication conduits and cables. MC cable shall cross telecommunication cables and conduits at right angles.
m. MC cabling shall not be run thru exposed ceilings, where open grid conditions exist, exposed on walls, or exposed to view. See Power Plan and Lighting Plan General Notes for additional requirements.

37. Installation of Electrical Nonmetallic Tubing (ENT) Cable (when use is permitted in the Allowed Specification Deviations Section or Deductive/Additive Alternate Pricing Section generally located on the symbols list drawing).

a. When approved for use in the Allowed Specification Deviations Section or Deductive/Additive Alternate Pricing Section, generally located on the symbols list drawing, ½" & ¾" trade size ENT shall be allowed for concealed lighting branch circuits, receptacle branch circuits and miscellaneous signal system circuits within concrete floors, walls and columns within parking structures.

b. ENT conduit shall meet the requirements of Underwriters Laboratories Standards 1479 & 1653, NEMA TC-13 and be UL listed.

c. All ENT conduit, ENT fittings, ENT boxes and ENT accessories shall be UL listed and manufactured by the same manufacturer so as to form a complete ENT system. ENT systems shall only be used if they are listed for use in fire resistance rated concrete floors and ceilings with resistance ratings as indicated elsewhere in the project plans. ENT system shall comply with NEC, or CEC where adopted, Article 362.

d. All ENT fittings and ENT boxes shall be concrete-tight listed without the use of tape. Additionally, ENT fittings shall be constructed of high impact PVC and able to resist ENT conduit pull out forces of a minimum of 175 lbs. ENT fittings with fewer than 6 locking tabs for ENT connection shall utilize manufacturer approved glue as additional protection from fitting/conduit separation. ENT conduit to rigid conduit transition fittings shall be equipped with set screw fittings on the rigid conduit side of the fitting. ENT to metal box fittings shall be equipped with a threaded end and lock washer.

e. Where tubing enters a box, fitting or other enclosure provide a bushing or adapter to protect conductors from abrasion unless the box, fitting enclosure design provides equivalent protection.

f. ENT junction boxes shall have brass screw inserts and shall be rated to support lighting fixtures weighing less than 50 lbs.

g. Concrete tight metal boxes shall be used to support pendant hung fixtures or fixtures over 50 lbs.

h. ENT shall be provided in continuous lengths between junction boxes without use of in-line splices or connectors and shall be clearly marked/labeled at least every 10-feet.

i. All ENT conduit containing electrical branch circuits shall contain a code-sized equipment ground conductor.

j. ENT shall transition to EMT, IMC, RMC, or rigid PVC, as appropriate or as called out elsewhere in this specification, for all exposed conduits within/on/under a parking structure.

k. ENT shall transition to appropriately sized PVC expansion joint(s) at all structure expansion or seismic joints.

l. ENT shall be securely fastened and supported every 2-3 ft. and within 1 ft. of every junction box and fitting to prevent movement and sag.

m. ENT shall be routed straight without sags, or excessive bending. Where bends are required, comply with Table 344.24 of the NEC for minimum radius of bends. Number of bends shall not exceed quantity allowed by code.

n. Separation of ENT from fittings, excessive sags or deflections in ENT runs that prevent pulling of wire, and other ENT system product or system installation failures/errors shall be corrected by saw cutting and patching as necessary at no additional cost to the Owner. Use of surface mounted conduits and junction boxes as a repair method is unacceptable.

o. Empty ENT runs shall be provided with a nylon pull string.

General Electrical Specifications
p. Coordinate installation of raceway with structural steel and other structural members. Do not cut, notch or otherwise alter structural members without obtaining approval in writing by the Structural Engineer of record.
q. No more than (2) ¾” ENT conduits may cross each other within a horizontal concrete slab without obtaining approval in writing by the Structural Engineer of record.

B. Installation of 600-Volt Conductors:

1. All electrical wire, including signal circuits, shall be installed in conduit.
2. All circuits and feeder wires for all systems shall be continuous from over current protective device or switch to terminal or farthest outlet. No joints shall be made except in pull, junction or outlet boxes, or in panel or switchboard gutters.

   a. Utilize preinsulated "winged" spring type connectors, 3M Company "Performance Plus" #O/B or #R/Y as required for splices and taps in conductors #6 AWG and smaller. When a spring connector is used in an underground environment or when subject to moisture, utilize a 3M Company Scotchcast 3507G epoxy resin connector sealing pack to seal the spring connector.

   b. Wires #4 AWG and larger AWG shall be joined together as follows:

      i. When located in an underground environment or when subject to moisture, the splice shall be made with compression connector and sealed by a 3M, or equal, PST cold shrink connector insulator.

      ii. When located in an interior environment, the splice shall be made with an Ilsco or equal dual rated, insulated splice-reducer connector or multi-tap connector-listed for use with 75/90 degree Celsius rated conductors.

   c. Connections to busbar shall be made with dual-rated copper/aluminum one-piece compression lugs. Paralleled conductor connections shall be by mechanical lugs.

3. Thoroughly clean all conduit and wire-ways and see that all parts are perfectly dry before pulling any wires.
4. Install UL approved fixture wire from all lighting fixture lamp sockets into fixture outlet or junction box.
5. For 20 ampere branch circuit wiring, increase #12 conductors to #10 for 120 volt circuits longer than 100 feet and for 277 volt circuits longer than 150 feet.
6. Conductor Support. Provide conductor supports as required by codes and recommended by cable manufacturer. Where required, provide cable supports in vertical conduits and provide lower end of conduit with a ventilator.

C. Grounding / Bonding:

1. Provide grounding and bonding for entire electric installation as shown on plans, as listed herein and as required by applicable codes. Included, but not limited to, are items that require grounding / bonding:

   a. Conduit, Raceways and Cable Trays.
   b. Neutral or identified conductors of interior wiring system.
   c. Panel boards, Distribution Boards, Switchgear and Switchboards.
   d. Non-current carrying metal parts of fixed equipment.
   e. Telephone distribution equipment.
   f. Inverters, UPS, PDU, RDC, Transfer Switch and Generator Systems.
   g. Raised Flooring.
   h. Antennas.
   i. Lightning Protection Systems.
j. Metal piping installed in or attached to a building/structure.
k. Metallically isolated structural steel.
l. Metallically isolated underground metal water piping.
m. Elevator hydraulic piston/lift case.

2. In multi-occupancy buildings, Contractor shall bond metal water piping systems installed in, under or attached to a building and/or structure serving individual occupancies where the piping system(s) are metallically isolated from each other. Per NEC, or CEC where adopted Art. 250.104(A)(2) and (4), the bonding conductor shall be sized per Table 250.122 and connected to the switchboard/panelboard serving that suite/occupancy.

3. Use of Ground Rods: Furnish and install required number of 3/4" x 10' copper clad ground rods to meet specified resistance, all required grounding wires, conduit and clamps. The size of the grounding conductors shall be not less than that set forth in the latest edition of the California Code of Regulations, Title 24, State of California and NEC (CEC, where adopted), unless otherwise indicated. Rods shall be installed such that at least 10 feet of length is in contact with the soil. Where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from vertical or shall be buried in a trench that is at least 30 inches deep. The upper end of the electrode shall be flush with or below ground level unless the above ground end and the grounding electrode conductor attachments are protected against physical damage. Unless otherwise noted, connection to the grounding electrode conductor may be by compression type or exothermic process connector. Mechanical connectors shall not be used.

4. Grounding System Connection:
   a. Compression connectors shall be unplated copper, manufactured by Burndy, or approved equal, designed specifically for the intended connection.
   b. Exothermic weld-type connectors shall be ‘Cadweld’ manufactured by Erico Products, or approved equal, designed specifically for the intended connection.
   c. Mechanical connectors shall not be used.

5. Isolated Ground Receptacles shall have an insulated ground wire connected between the receptacle and the panelboard isolated ground bus. Unless otherwise noted, this ground wire shall not be grounded at any other point, and shall be distinguished from other ground wires by a continuous yellow stripe.

6. Provide separate green equipment ground conductor in all electrical raceways, to effectively ground all fixtures, panels, controls, motors, disconnect switches, exterior lighting standards, and noncurrent carrying metallic enclosures. Use bonding jumpers, grounding bushings, lugs, busses, etc., for this purpose. Connect the equipment ground to the building system ground. Use the same size equipment ground conductors as phase conductors, up through #10 AWG. Use NEC (or CEC where adopted) Table 250.122 for conductor size with phase conductors # 8 and larger, if not shown on the Drawings.

7. Clean the contact surfaces of all ground connections prior to making connections.

8. Ductwork. Provide a flexible green ground strap, No. 6 AWG equivalent, at each flexible duct connection at each air handler, exhaust fan, and supply fan, and install to preclude vibration.

9. Motors. Connect the ground conductor to the conduit with an approved grounding bushing, and to the metal frame with a bolted solderless lug. Bolts, screws and washers shall be bronze or cadmium plated steel.

10. Building grounding system resistance to ground shall not exceed 25 ohms.

D. Line Voltage and Low Voltage Power Supplies to all Mechanical Equipment Including Plumbing, Heating and Air Conditioning Units;

1. An electric power supply, including conduit, any necessary junction and/or outlet boxes and conductors and connection shall be furnished and installed by this Contractor for each item or mechanical equipment.
2. Power supplies to individual items of equipment shall be terminated in a suitable outlet or junction box adjacent to the respective item of equipment, or a junction box provided by the manufacturer or the equipment and directed by the Mechanical Contractor. Allow sufficient lengths of conductor at each location to permit connection to the individual equipment without breaking the wire run.

3. The location of all conduit terminations to the equipment is approximate. The exact location of these conduit terminations shall be located and installed as directed by the Mechanical and Plumbing Contractor.

4. Provide power supplies to all plumbing and mechanical equipment, including but not limited to, equipment furnished and installed by Owner or Contractor such as heating and air conditioning equipment, pumps, boilers, auto valves, water coolers, trap primers etc. The installation shall produce a complete and operable system.

5. Unless otherwise noted, this Contractor shall furnish and install all conduit, boxes, wires, etc., for line voltage wiring and low voltage wiring.

6. It is the Contractor's responsibility to verify with the Drawings of other trades regarding the extent of his responsibility for mechanical equipment. The bid must include a sum sufficient to cover the cost of the installation.

7. The location of all power supply connection and/or terminations to the mechanical equipment is approximate. The exact locations of these terminations shall be verified with other trades during construction.

E. Prefabricated Equipment: Installation of all prefabricated items and equipment shall conform to the requirements of the manufacturer's specifications and installation instruction pamphlets. Where code requirements affect installation of materials and equipment, the more stringent requirements, code or manufacturer's instructions and/or specifications, shall govern the work.

F. Firestopping:

1. The Contractor shall be responsible for furnishing all material, labor, equipment, and services, in conjunction with the selection and installation of a complete and fully functioning and code compliant UL-listed fire stop assembly/system(s) as required by project conditions.

2. Each fire stop assembly/system shall have an "F" and/or "T" rating as required by each condition requiring fire stopping. Each fire stop assembly/system shall have a current U.L. listing, as indicated in the latest edition of the U.L. Fire Resistance Directory. Contractor shall verify acceptability of all fire stopping methods and system selections with the authority having jurisdiction prior to installation. The Contractor shall install each firestop assembly/system in accordance with the manufacturer's printed instructions.

3. Each fire stop assembly/system shall be labeled with fire stop manufacturer-furnished label on each side of the fire stopping systems depicting UL # etc.

End of Section 16010