CITY OF EL SEGUNDO

CONTRACT DOCUMENTS
PLANS & SPECIFICATIONS

FOR

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
350 MAIN STREET
EL SEGUNDO, CA 90245
310-524-2300

https://www.elsegundo.org/government/departments/city-clerk/bid-rfp

MANDATORY PRE-BID MEETING
TUESDAY, JUNE 30, 2026 AT 10:00 AM
CITY HALL COURTYARD
(SEE NEXT PAGE FOR LOCATION MAP)
350 MAIN STREET
EL SEGUNDO, CA 90245

BIDS DUE WEDNESDAY, JULY 15, 2026 AT 11:00 AM

MANDATORY PRE-BID MEETING LOCATION:

BIDS WILL BE RECEIVED
UP TO THE HOUR
OF 11:00 A.M.

WEDNESDAY, JULY 15, 2026

IN THE

OFFICE OF THE CITY CLERK
CITY HALL
350 MAIN STREET
EL SEGUNDO, CALIFORNIA 90245

AT WHICH TIME THEY WILL BE
PUBLICLY OPENED

SPECIAL INSTRUCTIONS TO CONTRACTORS

Contractors are required to review section 7-3 of the STANDARD SPECIFICATIONS, pages **II-B-24** thru **II-B-27** "LIABILITY INSURANCE".

ONLY CONTRACTORS ABLE TO OBTAIN AND FURNISH THE REQUIRED COVERAGE AND ENDORSEMENT "ISO" FORMS SHOULD CONSIDER SUBMITTING A BID PACKAGE.

The Contractor will be required to apply and obtain an Encroachment Permit from the City Public Works Department as well as any applicable Building/Safety Permit from the City Planning and Building Safety Department. The permits will be issued on a "no-fee" basis.

The Contractor shall be responsible for calling the Building Safety Division for inspections. All noted deficiencies shall be corrected by the contractor. The Project will not be accepted as complete until the contractor obtains a final sign-off from the Department of Planning and Building Safety.

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NOTICE INVITING SEALED BIDS
FOR THE
EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT

IN THE CITY OF EL SEGUNDO
PROJECT NO.: PW 26-05

The City of El Segundo is accepting sealed bids in the City Clerk's office, 350 Main Street, El Segundo, California 90245, until 11:00 a.m. on:

WEDNESDAY, JULY 15, 2026

at which time they will be publicly opened. Bids will not be accepted after that time.

As described in the Bidding Documents, the bids are for a Public Works Project ("Project") which consists of furnishing all materials, tools, equipment, labor, supervision, incidentals, and related work as shown on the plans on file with the City's Public Works Department.

Work on the Project must be performed in strict conformity with Specifications No. **PW 26-05** as adopted by the El Segundo City Council on **June 16, 2026** which is filed with the Public Works Department.

Plans, Specifications, Contract Documents and Engineer's estimate are available are electronically via https://www.elsegundo.org/government/departments/public-works/request-public-works-bid

A pre-bid meeting is scheduled for **June 30, 2026 at 10:00 am**, at the **City Hall Courtyard**, 350 Main Street, El Segundo, CA 90245. Bidders' attendance at this meeting is **mandatory**. Questions regarding the bid shall be submitted by **5:00 pm on Thursday, July 2** to https://www.elsegundo.org/government/departments/public-works/request-public-works-bid

The terms and conditions for bidding on the Project are described in the attached Bidding Instructions.

This Project requires payment of State prevailing rates of wages for Los Angeles County. The contractor must post copies of the prevailing schedule at each job site. Copies of these rates of wages are available from the State of California Department of Industrial Relations Prevailing Wage Unit, Telephone No. (415) 703-4774. The website for this agency is currently located at http://www.dir.ca.gov.

Note that the Project is subject to compliance monitoring and enforcement by California Department of Industrial Relations. Pursuant to California law, the City must find bids failing to comply with all applicable Labor Code requirements including, without limitation, Labor Code §§ 1725.5 and 1771.4 to be nonresponsive.

The contractor to whom the contract is awarded must assist in locating, qualifying, hiring and increasing the skills of minority group employees and applicants for employment, as set forth in Executive Order 11246 and 11375.

Any contract entered into pursuant to this notice will incorporate the provisions of the State Labor Code. Compliance with the prevailing rates of wages and apprenticeship employment standards established by the State Director of Industrial Relations will be required.

Affirmative action to ensure against discrimination in employment practices on the basis of race, color, national origin, ancestry, sex, or religion will also be required.

The City of El Segundo hereby affirmatively ensures that minority business enterprises will be afforded full opportunity to submit bids in response to this notice and will not be discriminated against on the basis of race, color, national origin, ancestry, sex, or religion in any consideration leading to the award of contract.

The Contractor's duty to pay State prevailing wages can be found under Labor Code Section 1770 et. Seq. and Labor Code Sections 1775 and 1777.7 outline the penalties for failure to pay prevailing wages and employ apprentices including forfeitures and debarment.

Five percent (5%) will be deducted from each progress payment and retained by the City. The remainder less the amount of all previous payments will be paid to the Contractor. Pursuant to Public Contracts Code ("PCC") § 22300, the Contractor may substitute securities for retention monies held by the City or request that the City place such monies into an escrow account. The Contractor is notified, pursuant to PCC § 22300, any such election will be at the Contractor own expense and will include costs incurred by the City to accommodate the Contractor's request.

In entering into a Public Works contract, or a subcontract, to supply goods, services, or materials pursuant to a Public Works contract, the **Contractor**, or **Subcontractor**, offers and agrees to assign to the awarding body all rights, title and interest in, and to, all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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.

Bids must be prepared on the approved Proposal forms in conformance with the Instructions to Bidders and submitted to the City Clerk, 350 Main Street, City of El Segundo, in a sealed envelope plainly marked on the outside:

"SEALED BIDS FOR PROJECT NO.: PW 26-05
EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
IN THE CITY OF EL SEGUNDO

DO NOT OPEN WITH REGULAR MAIL"

The bid must be accompanied by a bid bond, made payable to the City of El Segundo for an amount no less than **ten percent (10%)** of the amount bid for the base contract.

No bid will be accepted from a **Contractor** who has not been licensed in accordance with the provisions of the State Business and Professions Code. For this Project, those acceptable classes of license shall be **"B"**. The successful **Contractor** and his **Subcontractors** will be required to possess the correct license for their Project classifications, and valid City Business Licenses from the City of El Segundo.

The City of El Segundo reserves the right to reject any or all bids, to waive any irregularity, and to take all bids under advisement for a period of **ninety (90) calendar days.**

Any contract entered into pursuant to this notice shall become effective or enforceable against the City of El Segundo only when the formal written contract has been duly executed by the appropriate officer(s) of the City of El Segundo.

DATED this 16TH day of June 2026.

CITY OF EL SEGUNDO, CALIFORNIA

Susan Truax, City Clerk

BIDDING INSTRUCTIONS

1. DEFINITIONS. Unless provided otherwise, the definitions in the Greenbook, Special Conditions, or other Contract Documents are applicable to all Bidding Documents.

    1.1 "Addenda" means written or graphic instruments issued by the City before the Bid Deadline that modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.
    1.2 "Alternate" means a proposed change in the Work, as described in the Bidding Documents which, if accepted, may result in a change to either the Contract Sum or the Contract Time, or both.
    1.3 "Bid Deadline" means the date and time designated in the Notice for Bids as the last date and time for receipt of Bids, as may be revised by Addenda.
    1.4 "Bidder" means a person or firm that submits a Bid.
    1.5 "Bidding Documents" means the construction documents prepared and issued for bidding purposes including all Addenda
    1.6 "Lump Sum Base Bid" means the sum stated in the Bid for which Bidder offers to perform the Work described in the Bidding Documents, but not including unit price items or Alternates.
    1.7 "Unit Price" means an amount stated in the Bid for which Bidder offers to perform the Unit Price Work for a fixed price per unit of measurement.

2. BIDDER'S REPRESENTATIONS. By making its Bid, Bidder represents that:

    2.1 Bidder read, understood, and made the Bid pursuant to the requirements in the Bidding Documents.
    2.2 Bidder visited the Project site and is familiar with the conditions under which the Work will be performed and the local conditions as related to the Contract Documents.
    2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents.
    2.4 Bidder and all Subcontractors, regardless of tier, have the appropriate current licenses issued by the State of California Contractor's State License Board for the Work to be performed. If Bidder is a joint venture, the Bidder will have a joint venture license appropriate for the performance of the work, and each member of the joint venture will likewise have the appropriate license. Business and Professions Code §§ 7000-7191 establish licensing requirements for contractors. If a Bidder, that is a specialty contractor, submits a Bid involving 3 or more specialized building trades, the work of which is more than incidental and supplemental to the performance of the Work for which Bidder holds a specialty contractor license, Bidder must also hold either (1) a specialty contractor "C" license in each such trade, (2) a General Engineering contractor "A" license, or (3) a General Building contractor "B" license. This requirement is applicable whether or not Bidder lists a Subcontractor for each such trade.
    2.5 If licensure or proper licensure is controverted, then proof of licensure pursuant to this section must be made by production of a verified certificate of licensure from

the Contractors' State License Board which establishes that the individual or entity bringing the action was duly licensed in the proper classification of contractors at all times during the performance of any act or contract covered by the action. Nothing in this subdivision requires any person or entity controverting licensure or proper licensure to produce a verified certificate. When licensure or proper licensure is controverted, the burden of proof to establish licensure or proper licensure is on the licensee.

2.6 Bidder has the expertise and financial capacity to perform and complete all obligations under the Bidding Documents.

2.7 The person executing the Bid Form is duly authorized and empowered to execute the Bid Form on Bidder's behalf.

2.8 Bidder is aware of and, if awarded the Contract, will comply with Applicable Code Requirements in its performance of the Work.

2.9 The Bidder has paid the City's business license fee(s)

2.10 The Bidder, per SB 854 requirements for public Projects, has registered with and paid their annual fee to the California State Department of Industrial Relations. Information about SB 854 and its requirements can be found at this link: http://www.dir.ca.gov/Public-Works/SB854.html

3. BIDDING DOCUMENTS

3.1 Bidders may obtain complete sets of the Bidding Documents electronically via **https://www.elsegundo.org/government/departments/public-works/request-public-works-bid**.

3.2 Bidders will use a complete set of Bidding Documents in preparing Bids.

3.3 The City makes Bidding Documents available on the City's website for the sole purpose of obtaining Bids for the Work and does not confer a license or grant permission for any other use of the Bidding Documents.

4. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS.

4.1 Before submitting its Bid, Bidder will carefully study and compare the various documents comprising the Bidding Documents and compare them with any other work being bid concurrently or presently under construction which relates to the Work for which the Bid is submitted; will examine the Project site, the conditions under which the Work is to be performed, and the local conditions; and will at once report to the City's Representative errors, inconsistencies, or ambiguities discovered.

4.2 Requests for clarification or interpretation of the Bidding Documents will be addressed to the City's Representative.

4.2.1 The release of the bid package begins a quiet period for potential Bidders participating in this Project. The City of El Segundo realizes it is critical to provide Bidders with a vehicle to ask questions so that quality responses can be prepared. Questions must be submitted in writing to project managers via the City website: https://www.elsegundo.org/government/departments/public-works/request-public-works-bid
Responses to all questions will be provided in writing to all Bidders in

accordance with the schedule below. We will not identify companies or individuals that pose questions. Potential bidders must not call City of El Segundo employees to discuss potential projects or ask questions regarding the bid.

Questions Due by 5:00 pm, Thursday, July 2, 2026

Questions Answered by 5:00 pm, Wednesday, July 8, 2026

4.3 Clarifications, interpretations, corrections, and changes to the Bidding Documents will be made by Addenda. Clarifications, interpretations, corrections, and changes to the Bidding Documents made in any other manner will not be binding and Bidders must not rely upon them.

5. PRODUCT SUBSTITUTIONS. No substitutions will be considered before award of Contract. Substitutions will only be considered after award of the Contract and as provided for in the Contract Documents.

6. SUBCONTRACTORS.
   6.1 Each Bidder will list in the Bid Form all first-tier Subcontractors that will perform work, labor or render such services. The Bid Form contains spaces for the following information when listing Subcontractors: (1) Work Activity; (2) name of Subcontractor; (3) city of Subcontractor's business location. Failure to list any of these items on the Bid Form will result in the City treating the Bid as if no Subcontractor was listed for the Work and that Bidder represents to the City that it is fully qualified to perform that portion of the Work and will perform do so.
   6.2 Subcontractors listed in the Bid Form will only be substituted after the Bid Deadline with the City's written consent in accordance with California law.

7. ADDENDA.
   7.1 Addenda will be in writing and issued only by the City. Addenda will be emailed to all who are known by the City to have received a complete set of Bidding Documents and who have provided an email address for receipt of Addenda.
   7.2 Copies of Addenda will be made available for inspection at the City's Public Works Department.
   7.3 The City will issue Addenda so that they are received by prospective Bidders not later than three (3) business days before the Bid Deadline. Addenda that withdraw the request for Bids or postpone the Bid Deadline may be issued anytime before the Bid Deadline.
   7.4 Each Bidder is responsible for ensuring that it has received all issued Addenda before issuing a Bid.

8. PRE-BID CONFERENCE. Bidder will attend a Pre-Bid Conference where the City will discuss the Bidding Documents, answer questions, accept comments, and conduct a Project site visit. The City requires all Pre-Bid Conference attendees to arrive for the meeting on time and to sign an attendance list which is used to determine if Bidders meet this

requirement. Any Bidder not attending the Pre-Bid Conference in its entirety will be deemed to have not complied with the requirements of the Bidding Documents and its Bid will be rejected.

9. FORM AND STYLE OF BIDS

9.1 Bids will be submitted on the Bid Form included with the Bidding Documents. Bids not submitted on the City's Bid Form will be rejected.

9.2 All blanks on the Bid Form will be filled in legibly in ink or typewritten by computer.

9.3 Bidder's failure to submit a price for any Alternate or unit price will result in the Bid being considered as nonresponsive. If Alternates are called for and no change in the Lump Sum Base Bid is required, enter "No Change."

9.4 Each Bidder must fill out the "Bidders Statement of Past Contract Disqualifications" form stating any and all instances of contract disqualifications due to a violation of a law or safety regulation. The Bidder must explain the circumstances of each disqualification. The City may reject the bid based on such information.

9.5 Bidder will make no stipulations on the Bid Form nor qualify the Bid in any manner.

9.6 The Bids will be based upon full completion of all the Work as shown on the plans and specifications. It is expressly understood that the plans are drawn with as much accuracy as is possible in advance, but should errors, omissions or discrepancies exist in the plans which show conditions that vary from those encountered in construction, the Bidder (if awarded the Contract) specifically agrees to construct a completed work ready for the use and in the manner which is intended. In the event of increasing or decreasing of work, the total amount of work actually done or materials or equipment furnished must be paid for according to the unit or lump sum price established for such work under the contract, wherever such unit or lump sum price has been established. In the event no prices are named in the contract to cover such changes or alterations, the cost of such changes must be covered as extra work.

9.7 The Bid Form will be signed by a person or persons legally authorized to bind Bidder to a contract. Bidder's Representative will sign and date the Declaration included in the Bid Form. Failure to sign and date the declaration will cause the Bid to be rejected.

9.8 Bids must be submitted in writing on the Proposal forms provided by the City of El Segundo. One (1) set of these Proposal forms is inserted loose herein for use by the bidders. **Bidders are required to submit one (1) original set of the proposal forms.** All information requested therein must be clearly and legibly set forth in the manner and form indicated.

9.9 Bidders must satisfy themselves by personal examination of the work site, Plans, Specifications, and other contract documents, and by any other means as they may believe necessary, as to the actual physical conditions, requirements and difficulties under which the work must be performed. No bidder shall at any time after submissions of a proposal make any claim or assertion that there was any misunderstanding or lack of information regarding the nature or amount of work necessary for the satisfactory completion of the job. Any errors, omissions, or

discrepancies found in the Plans, Specifications, or other contract documents shall be called to the attention of the City of El Segundo and clarified prior to the submission of proposals.

10. BID SECURITY

10.1 Each Bid will be accompanied by Bid Security, in the amount of 10% of the Lump Sum Base Bid as security for Bidder's obligation to enter into a Contract with the City on the terms stated in the Bid Form and to furnish all items required by the Bidding Documents. Bid Security will be a Bid Bond on the form provided by the City or a certified check made payable to "City of El Segundo." When a Bond is used for Bid Security, failure to use the City's Bid Bond form will result in the rejection of the Bid.

10.2 If the apparent lowest responsible Bidder fails to sign the Agreement and furnish all items required by the Bidding Documents within the time limits specified in these Instructions to Bidders, the City will disqualify such Bidder and select the next apparent lowest responsible Bidder until all bids have been exhausted or the City may reject all bids. In such an event, the disqualified Bidder will be liable for and forfeit to the City the amount of the difference, not to exceed the amount of the Bid Security, between the amount of the disqualified Bid and the larger amount for which the City procures the Work.

10.3 If a Bid Bond is submitted and an attorney-in-fact executes the Bid Bond on behalf of the surety, a notarized and current copy of the power of attorney will be affixed to the Bid Bond. The surety issuing the Bid Bond will be listed in the latest published State of California, Department of Insurance list of, "Insurers Admitted to Transact Surety Insurance in This State."

10.4 The City will retain Bid Security until the occurrence of one of the following:

10.4.1 All items required by the Bidding Documents have been furnished and the Agreement has been signed by the successful Bidder and the City.

10.4.2 The specified time has elapsed during which Bids may be withdrawn.

10.4.3 All Bids have been rejected.

10.5 The Bid Form, Bid Security, and all other documents required to be submitted with the Bid must be enclosed in a sealed opaque envelope. The envelope must be addressed to the City Clerk. The envelope must be identified with the Bidder's name and address, and identify the Project for which the Bid is submitted., as follows: "SEALED BIDS FOR PW 26-05: EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT IN THE CITY OF EL SEGUNDO. DO NOT OPEN WITH REGULAR MAIL." Proposals may be mailed or delivered by messenger.

10.6 Bids will be deposited at the designated location on or before the Bid Deadline. A Bid received after the Bid Deadline will be returned to Bidder unopened.

10.7 Bidder will assume full responsibility for timely delivery at the location designated for receipt of Bids.

10.8 Oral, telephonic, facsimile, or telegraphic Bids are invalid and will not be accepted.

10.9 All proposals must be submitted, filed, made, and executed in accordance with State and Federal laws related to bids for contracts of this nature whether the same is expressly referred to herein or not. Any bidder submitting a proposal shall by such

action thereby agree to each and all of the terms, conditions, provisions, and requirements set forth, contemplated, and referred to in the Plans, Specifications, and other contract documents, and to full compliance therewith.

11. MODIFICATION OR WITHDRAWAL OF BID.
    - 11.1 Before the Bid Deadline, a submitted Bid may be modified or withdrawn. Notice of such action will be given to the City in writing and signed by the Bidder's authorized representative. A change so made will be so worded as not to reveal the amount of the original Bid.
    - 11.2 A withdrawn Bid may be resubmitted up to the Bid Deadline, provided that it then fully complies with the Bidding Requirements.
    - 11.3 Bid Security will be in an amount sufficient for the Bid as modified or resubmitted.
    - 11.4 Bids may not be modified, withdrawn, or canceled within ninety (90) calendar days after the Bid Deadline unless otherwise provided in Supplementary Instructions to Bidders.
    - 11.5 Proposals may not be withdrawn after said Bid Deadline without forfeiture of the proposal guarantee.
    - 11.6 The withdrawal of a proposal will not prejudice the right of the bidder to submit a new proposal, providing there is time to do so.
    - 11.7 No mention shall be made in the proposal of Sales Tax, Use Tax, City Business License, or any other tax, as all amounts bid will be deemed and held to include any such taxes, which may be applicable.
    - 11.8 No mention shall be made in the proposal of the cost of bonds as all amounts bid will be deemed and held to include any such costs, which may be applicable.

12. OPENING OF BIDS. Bids submitted in the manner required by these instructions and are received on or before the Bid Deadline will be opened publicly.

13. REJECTION OF BIDS.
    - 13.1 The City will have the right to reject all Bids.
    - 13.2 The City will have the right to reject any Bid not accompanied by the required Bid Security or any other item required by the Bidding Documents, or a Bid which is in any other way materially incomplete or irregular.
        - 13.2.1 Unrequested/unauthorized conditions, limitations, or provisions attached to a proposal will render it irregular and may cause its rejection. The completed proposal forms shall be without interlineations, alterations, or erasures. Alternative proposals will not be considered unless specifically requested. No oral, telegraphic, or telephonic proposal, modification, or withdrawal will be considered.
    - 13.3 In the event that any bidder acting as a prime contractor has an interest in more than one proposal, all such proposals will be rejected, and the bidder will be disqualified. This restriction does not apply to subcontractors or suppliers who may submit quotations to more than one bidder, and while doing so, may also submit a formal proposal as a prime contractor. No proposal will be accepted from a bidder who has not been licensed in accordance with the provisions of the State Business and

Professions Code.

14. AWARD

14.1 The City may retain all bids for a period of ninety (90) calendar days for examination and comparison, and to delete any portion of the work from the contract.

14.2 The City will have the right to waive nonmaterial irregularities in a Bid and to accept the lowest responsive Bid as determined by The City.

14.3 The City will have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents.

14.4 Unless stated otherwise on bidding documents (e.g., Bid Schedule), the City will determine the low Bidder on the basis of the sum of the Lump Sum Base Bid plus all unit prices multiplied by their respective estimated quantities as stated in the Bid Form, if any, plus the Contractor Delay Damages multiplied by the "multiplier" as stated in the Bid Form, plus the amounts of all accepted Alternates.

14.4.1 Inclusion of Contractor Delay Damages within the Bid Form is solely for the purpose of determining the low bidder and establishing the City's maximum daily liability as a result of City delays to Contractor, if any, and City has no obligation to pay any daily Contractor Delay Damages except as provided for in these Contract Documents for Compensable Delays. In the event that City becomes liable to Contractor for compensable delays, City agrees to pay Contractor the daily Contractor Delay Damages set forth in the Proposal Form or Contractor's actual daily delay damages, whichever is less, for each day of Compensable Delay as provided for by these Contract Documents.

14.5 The City will select the apparent lowest responsive and responsible Bidder and notify such Bidder within thirty (30) calendar days (unless number of days is modified in Supplementary Instructions to Bidders) after the Bid Deadline or reject all bids. Within ten (10) days after receiving the City's notice that Bidder was selected as the apparent lowest responsible Bidder, Bidder will submit to the City all of the following items:

14.5.1 One original of the Agreement signed by Bidder.

14.5.2 One original of the Payment Bond.

14.5.3 One original of the Performance Bond.

14.5.4 Certificates of Insurance on form provided by the City.

14.5.5 Names of all Subcontractors, with their addresses, telephone number, facsimile number, trade on Bidders' company stationery. Evidence, as required by the City, of the reliability and responsibility of the proposed Subcontractors such as statements of experience, statements of financial condition, and references.

14.5.6 Preliminary Contract Schedule.

14.5.7 Selection of Retention Options and Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention. If not submitted, the City will withhold retention.

14.5.8 Cost Breakdown.

14.6 Before award of the Contract, the City will notify Bidder in writing, if the City

objects to a Subcontractor proposed by Bidder, in which case Bidder will propose a substitute acceptable to the City. Failure of the City to object to a proposed Subcontractor before award will not preclude the City from requiring replacement of any Subcontractor based upon information received subsequent to award, information which cannot be properly evaluated before award due to time constraints, or information relating to a failure to comply with the requirements of the Contract.

14.7 If Bidder submits the original signed Agreements and all other items within ten (10) days after receiving the City's notification, and all such items comply with the requirements of the Bidding Documents, the City will award the Contract to Bidder by signing the Agreement and returning a signed copy of the Agreement to Bidder.

14.8 If the City consents to the withdrawal of the Bid of the apparent lowest responsible Bidder, or the apparent lowest responsible Bidder fails or refuses to sign the Agreement or submit to the City all of the items required by the Bidding Documents, within ten (10) days after receiving the City's notification, or the City determines that the Bidder is not financially or otherwise qualified to perform the Contract, the City may reject such Bidder's Bid and select the next apparent lowest responsible Bidder, until all bids are exhausted, or reject all Bids.

PROPOSAL
FOR THE
EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Date _____, 20___

Company Name: _____
TO THE CITY OF EL SEGUNDO:

In accordance with the City of El Segundo's Notice Inviting Sealed Bids, the undersigned **BIDDER** hereby proposes to furnish all materials, equipment, tools, labor, and incidentals required for the above stated Project as set forth in the Plans, Specifications, and contract documents therefor, and to perform all work in the manner and time prescribed therein.

BIDDER declares that this proposal is based upon careful examination of the work site, Plans, Specifications, Instructions to Bidders, and all other contract documents. Submittal of this bid shall be considered evidence that the **BIDDER** has satisfied himself regarding the contract documents, access and any other field conditions which may affect bid prices. If this proposal is accepted for award, **BIDDER** agrees to enter into a contract with the City of El Segundo at the unit and/or lump sum prices set forth in the following Bid Schedule. **BIDDER** understands that failure to enter into a contract in the manner and time prescribed will result in forfeiture to the City of El Segundo of the proposal guarantee accompanying this proposal.

BIDDER understands that a bid is required for the entire work, that the estimated quantities set forth in the Bid Schedule are solely for the purpose of comparing bids, and that final compensation under the contract will be based upon the actual quantities of work satisfactorily completed. **THE CITY OF EL SEGUNDO RESERVES THE RIGHT TO INCREASE OR DECREASE THE AMOUNT OF ANY QUANTITY SHOWN AND TO DELETE ANY ITEM FROM THE CONTRACT.** It is agreed that the unit and/or lump sum prices bid include all apparent expenses, taxes, royalties, and fees. In the case of discrepancies in the amounts bid, unit prices shall govern over extended amounts, and words shall govern over figures.

If awarded the Contract, the undersigned further agrees that in the event of the **BIDDER'S** default in executing the required contract and filing the necessary bonds and insurance certificates within ten working days after the date of the City of El Segundo's notice of award of contract to the **BIDDER**, including sending by U.S. Mail a Public Works Contract for signature by the Awardee, the proceeds of the security accompanying this bid shall become the property of the City of El Segundo and this bid and the acceptance hereof may, at the City of El Segundo's option, be considered null and void.

EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE

BIDDER certifies that in all previous contracts or subcontracts, all reports which may have been due under the requirements of any agency, State, or Federal equal employment opportunity orders have been satisfactorily filed, and that no such reports are currently outstanding.

AFFIRMATIVE ACTION CERTIFICATION

BIDDER certifies that affirmative action has been taken to seek out and consider minority business enterprises for those portions of the work to be subcontracted, and that such affirmative actions have been fully documented, that said documentation is open to inspection, and that said affirmative action will remain in effect for the life of any contract awarded hereunder. Furthermore, **BIDDER** certifies that affirmative action will be taken to meet all equal employment opportunity requirements of the contract documents.

NONCOLLUSION DECLARATION

BIDDER declares that the only persons or parties interested in this proposal as principals are those named herein; that no officer, agent, or employee of the City of El Segundo is personally interested, directly or indirectly, in this proposal; that this proposal is made without connection to any other individual, firm, or corporation making a bid for the same work and that this proposal is in all respects fair and without collusion or fraud.

BID SCHEDULE

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Company Name: _____

Note: Bid Item work is elaborated in detail in the Project plans and specifications.

ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
BASE BID ITEMS					
1	Mobilization/ Demobilization	LS	1	$	$
2	Demolition, including demo of existing non-structural walls, wall coverings/wallpaper, soffit, carpet, baseboard, doors, doorframes, door hardware, in-floor cover plates at floor boxes, millwork, televisions and mounting brackets, ceiling mounted projector and mounting hardware, whiteboards, metal cabinets, plumbing, lighting, electrical, telecom, and data/technology	LS	1	$	$
3	Procurement and installation of new carpet and baseboard, including floor prep	LS	1	$	$
4	Installation of new millwork, counters, and cabinetry	LS	1	$	$
5	Modification of existing doorway to meet accessibility requirements including doorframe, drywall, any required structural steel, any required door hardware, door transition strips, and removal and reinstallation of existing door	LS	1	$	$
6	Procurement and installation of new televisions, smartboards, and mounting brackets	LS	1	$	$
7	Procurement and installation of new counter depth refrigerator	LS	1	$	$
8	Procurement and installation of new magnetic dry erase whiteboards including mounting hardware	LS	1	$	$
9	Construction of ceiling grid, ceiling tile, and soffit modifications	LS	1	$	$

10	Finishes – painting, patch/repair ceiling and drywall	LS	1	$	$
11	Installation of new light fixtures, switches, sensors, and controls	LS	1	$	$
12	Installation of electrical components including wiring, conduits, raceways, and outlets	LS	1	$	$
13	Installation of new flush mounted cover plates at existing floor boxes	LS	1	$	$
14	Installation of new plumbing fixtures including sink, faucet, and refrigerator water connection	LS	1	$	$
15	Installation of technology components, hardware, and equipment including wiring, cables, conduits, sleeves, raceways, supports, outlets, wire management, patch cords, jack panels, speakers, microphones, cameras, touch panels, and extenders	LS	1	$	$
16	Removal, relocation, storage, and reinstallation of existing furniture, wall plaques, and wall seals/signage to be reused	LS	1	$	$
17	Miscellaneous improvements as determined necessary by the engineer	LS	1	$10,000	$10,000

TOTAL BASE BID (#1 thru #17) =
$_____

TOTAL BASE BID WRITTEN IN WORDS:

_____

All work shall be per these specifications and attachments. Prevailing wage rates apply. The City of El Segundo reserves the right to reject any or all bids, to waive any irregularity, and to take all bids under advisement for a period of **ninety (90) calendar days.**

BIDDER'S INFORMATION

Company Name: _____

BIDDER certifies that the following information is true and correct:
Form of Legal Entity (i.e., individual, partnership, corporation, etc.)

_____

If corporation, State of Incorporation (i.e., California) _____

Business _____

Street Address _____

_____

Telephone No. _____ Email Address _____

State Contractor's License No. and Class _____

Original Date Issued _____ Expiration Date _____

Contractor's Department of Industrial Relations (DIR) Information:

Registration No. _____ Expiration Date _____

The following are the names, titles, addresses, and phone numbers of all individuals, firm members, partners, joint venturers, and/or corporate officers having principal interest in this proposal:

_____

_____

_____

The date of any voluntary or involuntary bankruptcy judgments against any principal having an interest in this proposal is as follows:

_____

_____

All current and prior DBA's, aliases, and/or fictitious business names for any principal having an interest in this proposal are as follows:

_____

_____

BIDDER'S INFORMATION (CONTINUED)

Company Name: _____

Bidder shall list the name of the person who attended the mandatory pre-bid job walk:

Name: _____

Title: _____

IN WITNESS WHEREOF, BIDDER executes and submits this proposal with the names, titles, hands, and seals of all aforenamed principals this _____ day of _____, 20___.

BIDDER NAME AND CONTACT INFORMATION

_____

_____

_____

_____

_____

_____

_____

Bidder Signature: _____

Subscribed and sworn to this _____ day of _____, 20___.

NOTARY PUBLIC

_____

PROPOSAL GUARANTEE
BID BOND

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

KNOW ALL MEN BY THESE PRESENTS that,

_____ **,** as **BIDDER,** and

_____ **,** as **SURETY,** are held and firmly bound unto the

City of El Segundo, in the penal sum of _____ **DOLLARS ($_____),** which is ten (10%) percent of the total amount bid by **BIDDER** to the City of El Segundo for the above stated Project, for the payment of which sum**,** BIDDER **and** SURETY **agree to be bound, jointly and severally, firmly by these presents.**

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that, whereas **BIDDER** is about to submit a bid to the City of El Segundo for the above stated Project, if said bid is rejected, or if said bid is accepted and a contract is awarded and entered into by **BIDDER** in the manner and time specified, then this obligation shall be null and void, otherwise it shall remain in full force and effect in favor of the City of El Segundo.

IN WITNESS WHEREOF the parties hereto have set their names, titles, hands, and seals this

_____ day of _____, 20____.

BIDDER* _____

_____

_____

SURETY* _____

_____

_____

Subscribed and sworn to this _____ day of _____, 20____.
NOTARY PUBLIC
*****Provide **BIDDER/SURETY** name, title, address and telephone number and the name, title, address and telephone number for authorized representative.

CONTRACTOR'S LICENSE DECLARATION
(Business and Professions Code Section 7028.15)

1. **BIDDER'S** Contractor's License Number is: _____

Class No.: _____

2. The expiration date of **BIDDER'S** Contractor License is:_____

3. **BIDDER** acknowledges that Section 7028.15(e) of the Business and Professions Code provides as follows:

"A licensed contractor shall not submit a bid to a public agency unless his or her contractor's license number appears clearly on the bid, the license expiration date is stated, and the bid contains a statement that representations herein are made under penalty of perjury. Any bid not containing this information, or a bid containing information which is subsequently proven false, shall be considered non-responsive and shall be rejected by the public agency."

The undersigned declares, under penalty of perjury, that the representations made by the undersigned in this bid proposal are true and correct.

Executed on _____, 20___, at

_____ (insert City and State where Declaration signed).

_____
Signature

_____
Typed Name

_____
Title

_____
Company Name

NON-COLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
(pursuant to Cal. Pub. Contract Code § 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

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

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

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

Dated this _____ day of _____, 20___.

_____
Name

_____
Title

_____
Signature

WORKER'S COMPENSATION CERTIFICATION

Section 1861 OF THE LABOR CODE
(Workers' Compensation)

Pursuant to Section 1861 of the Labor Code, the **BIDDER**, in submitting his/her **PROPOSAL**, shall sign the following certification:

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

Signature of Bidder: _____

Title: _____

Business Name: _____

_____

Business Address: _____

_____

Telephone Number: (_____)_____

Dated this _____ day of _____, 20___.

BIDDER'S CERTIFICATION OF SUBCONTRACTORS
EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Company Name: _____

As detailed in Section 2-3 (Page II-B-3) of the General Provisions, Bidder certifies that it has listed below all subcontractors who will perform work in excess of one-half of one percent (0.5%) of the total bid price or certifies that the bidder is fully qualified to perform and will perform that portion of the work itself.

Name of Subcontractor	Address	Subcontractor's Contractor License No. & DIR Registration No.	Description of Portion of Work Subcontracted	Estimated $ Amount
	(Number and Street)	(CSLB #)		
	(City, Zip Code)	(DIR #)		

(Make copies of this page if additional space is needed)

_____ _____
Signature of Bidder Date

REFERENCES

Company Name: _____

The following are the names, addresses, and telephone numbers for public agencies for which **BIDDER** has performed similar work as the prime contractor or major subcontractor within the past five (5) years:

1. Project Owner: _____

Project title: _____
Type of work: _____
Contact name: _____
Telephone: _____
Email address: _____
Contract amount: $ _____
Date completed: _____

Did your firm have any financial interest in Project? _____

2. Project Owner: _____

Project title: _____
Type of work: _____
Contact name: _____
Telephone: _____
Email address: _____
Contract amount: $ _____
Date completed: _____

Did your firm have any financial interest in Project? _____

3. Project Owner: _____

Project title: _____
Type of work: _____
Contact name: _____
Telephone: _____
Email address: _____
Contract amount: $ _____
Date completed: _____

Did your firm have any financial interest in Project? _____

4. Project Owner: _____

Project title: _____
Type of work: _____
Contact name: _____
Telephone: _____
Email address: _____
Contract amount: $ _____
Date completed: _____

Did your firm have any financial interest in Project? _____

5. Project Owner: _____

Project title: _____
Type of work: _____
Contact name: _____
Telephone: _____
Email address: _____
Contract amount: $ _____
Date completed: _____

Did your firm have any financial interest in Project? _____

Bidder may attach additional reference pages if necessary.

The following are the names, addresses, and telephone numbers for all brokers and sureties from whom **BIDDER** intends to procure insurance bonds:

_____

_____

_____

_____

BIDDER'S STATEMENT OF
PAST CONTRACT DISQUALIFICATIONS

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Company Name: _____

Please state all instances of being disqualified, removed, or otherwise prevented from bidding on, or completing, a federal, state, or local government project due to a violation of a law or safety regulation.

1. Have you ever been disqualified from any government contract?

   Yes ☐ No ☐

2. If yes, explain the circumstances:

_____

_____

_____

_____

_____

_____

_____

_____

3. Are you registered in accordance with Labor Code § 1725.5 [Note: failure to register requires the City to reject your bid as nonresponsive]?

   Yes ☐ No ☐

_____
Bidder's Signature

_____
Name (Please Print)

INSURANCE REQUIREMENTS
[MUST BE SUBMITTED WITH PROJECT PROPOSAL]
EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Company Name: _____

To be awarded this contract, the successful bidder must procure and maintain the following types of insurance with coverage limits complying, at a minimum, with the limits set forth below:

Type of Insurance	Limits
Commercial general liability:	$2,000,000
Business automobile liability:	$1,000,000
Workers compensation:	Statutory requirement

**The city has the option to increase the limits as required for more complex and major waterworks, sanitation, and road pavement projects.*

Commercial general liability insurance must meet or exceed the requirements of ISO-CGL Form No. CG 00 01 04 13. The amount of insurance set forth above must be a combined single limit per occurrence for bodily injury, personal injury, and property damage for the policy coverage. Liability policies must be endorsed to name the City, its officials, and employees as "additional insureds" under said insurance coverage and to state that such insurance will be deemed "primary" such that any other insurance that may be carried by the City will be excess thereto. Such insurance must be on an "occurrence," not a "claims made," basis and will not be cancelable or subject to reduction except upon thirty (30) days prior written notice to the City. Insurer will agree in writing to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by Contractor for the City.

Automobile coverage must be written on ISO Form CA 00 01, covering Code 1 (Any Auto).

The Contractor must furnish to the City duly authenticated Certificates of Insurance evidencing maintenance of the insurance required under this Agreement, endorsements as required herein, and such other evidence of insurance or copies of policies as may be reasonably required by the City from time to time. Insurance must be placed with admitted insurers with a current A.M. Best Company Rating equivalent to at least a Rating of "A:VII." Certificate(s) must reflect that the insurer will provide thirty (30) day notice of any cancellation of coverage. The Contractor will require its insurer to modify such certificates to delete any exculpatory wording stating that failure of the insurer to mail written notice of cancellation imposes no obligation, and to delete the word "endeavor" with regard to any notice provisions.

The City requires California Worker's Compensation Coverage with the associated Waiver. Out-of-state coverage will not be accepted in lieu of the California coverage, because the work is being performed in the State of California.

By signing this form, the bidder certifies that it has read, understands, and will comply with these insurance requirements if it is selected as the City's Contractor. Failure to provide this insurance will render the bidder's proposal "nonresponsive."

_____ _____

Date Bidder's Signature

END PROPOSAL SECTION

PUBLIC WORKS AGREEMENT
BETWEEN
THE CITY OF EL SEGUNDO AND
[CONTRACTOR]

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

This CONTRACT is entered into this____ day of ___, 20__, ("Effective Date") by and between the City of El Segundo, a municipal corporation and general law city ("City") and [Entity Name], a _____[Location and type of entity, e.g., a California corporation]_____ ("Contractor").

1. WORK.

A. The Contractor shall perform all work required by and set forth in the Contract Documents (the "Work") in a good and workmanlike manner for the project identified in the Contract Documents, as attached hereto and incorporated by reference. The Contractor agrees to perform additional work arising from changes ordered by the City in accordance with the Contract Documents.

B. The Contractor shall furnish all of the labor; supplies and materials; equipment; printing; vehicles; transportation; office space and facilities; all tests, testing and analyses; and all matters whatsoever (except as otherwise expressly specified to be furnished by the City) needed to perform and complete the Work and provide the services required of the Contractor by the Contract Documents.

C. The Contractor and the City agree to abide by the terms and conditions contained in the Contract Documents. "Contract Documents" means this Contract and the following, as applicable:

- Notice Inviting Bids;
- Instructions to Bidders;
- Supplementary Instructions to Bidders;
- Bid Proposal and Bid Bond;
- Standard Specifications;
- Supplementary Conditions;
- Exhibits;
- Insurance Requirements;
- Labor and Material Payment Bond;
- Performance Bond
- Technical Specifications;
- List of Drawings;
- Drawings;

- Addenda;
- Notice to Proceed;
- Change Orders;
- Notice of Completion.

"Contract Documents" also includes all other documents identified in the Contract Documents which together form the contract between the City and the Contractor for the Work. The Contract Documents constitute the complete agreement between the City and the Contractor and supersede any previous agreements or understandings.

2. **CONTRACT SUM.** In consideration of the services rendered hereunder, the City shall pay the Contractor a sum not to exceed amount of _____ ($_____) for the Work in the manner set forth in the Contract Documents, in accordance with the prices set forth therein. Contractor shall provide City with a monthly invoice for current completed work. The City shall make payments within thirty-five (35) days after receipt of the Contractor's undisputed and properly submitted invoice, including an updated schedule of work. The City shall return to the Contractor any invoice determined not to be a proper payment request as soon as practicable, but not later than seven (7) days after receipt and shall explain in writing the reasons why the payment request is not proper. Contractor shall have seven days from written notice of improper payment request to submit a revised request satisfactory to the City. Payment for a properly revised payment request shall then be paid by the City within a reasonable period thereafter.

3. **SECURITIES AND BONDS.** Within ten (10) working days of the Effective Date of this Contract, the Contractor shall furnish a labor and material payment bond in an amount equal to one hundred percent (100%) of the Contract Sum, and a faithful performance bond in the amount equal to one hundred percent (100%) of the Contract Sum. Said bonds shall be secured from a surety company admitted and authorized to do business in California as such and satisfactory to the City. Upon filing the Notice of Completion, the Contractor shall be required to maintain a labor and material payment bond for a period of seven (7) months. Additionally, the faithful performance bond amount shall be reduced to an amount equal to fifteen percent (15%) of the Contract Sum and shall remain in effect until the end of all warranty periods set forth in the Contract Documents, or, if no warranty period is specified, for a period of twelve (12) months after filing of the Notice of Completion. (Note: Securities are not required if Contract Sum is less than $25,000.)

4. **INSURANCE.**

   A. Before commencing performance under this Agreement, and at all other times this Agreement is effective, Contractor will procure and maintain the following types of insurance with coverage limits complying, at a minimum, with the limits set forth below:

Type of Insurance	Limits
Commercial general liability:	$2,000,000 per occurrence
Business automobile liability	$1,000,000 per occurrence
Workers Compensation	Statutory Requirement (only if Contractor has employees)

**The city has the option to increase the limits as required for more complex and major waterworks, sanitation, and road pavement projects.*

B. Commercial general liability ("CGL") insurance must meet or exceed the requirements of ISO-CGL Form No. Form CG 00 01 04 13, or equivalent, covering CGL on an "occurrence" basis, including property damage, bodily injury and personal & advertising injury with limits no less than $2,000,000 per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (ISO CG 25 03 or 25 04) or the general aggregate limit shall be twice the required occurrence limit.

C. For automobiles, the insurance must meet or exceed the requirements of Insurance Services Office Form Number CA 0001 covering Code 1 (any auto), or, if Contractor provides proof of a personal automobile policy, such personal policy must include and indicate business venture coverage with limits no less than $1,000,000 per accident for bodily injury and property damage. If Contractor has no owned autos, Code 8 (hired) and 9 (non-owned), with limits no less than $1,000,000 per accident for bodily injury and property damage must be included in coverage.

D. The amount of insurance set forth above will be a combined single limit per occurrence for bodily injury, personal injury, and property damage for the policy coverage. Liability policies will be endorsed to name City, its officials, and employees as "additional insureds" under said insurance coverage and to state that such insurance will be deemed "primary" such that any other insurance that may be carried by City will be excess thereto. City's additional insured status will apply with respect to liability and defense of suits arising out of Contractor's acts or omissions. Such insurance will be on an "occurrence," not a "claims made," basis and will not be cancelable or subject to reduction except upon thirty (30) days prior written notice to City, and the notice must include any necessary endorsement to facilitate such notice to City.

E. Required Insurance Endorsement Language:

i. Additional Insured Endorsement with this language: "The City of El Segundo, its elected and appointed officials, employees, and volunteers as additional insureds."

ii. Cancellation Endorsement with this language: "The City of El Segundo will receive thirty (30) days written notice in the event of cancellation, nonrenewed or reduction."

iii. Primary and Non-Contributory Endorsement with this language: "Coverage is primary and non-contributory such that any other insurance that may be carried by the City will be excess thereto."

F. Contractor will furnish to City valid Certificates of Insurance evidencing maintenance of the insurance required under this Agreement, a copy of an Additional Insured endorsement confirming CITY has been given Additional Insured status under the Contractor's General Liability policy, and such other evidence of insurance or copies of policies as may be reasonably required by City from time to time. Insurance must be placed with insurers with a current A.M. Best Company Rating equivalent to at least a Rating of "A:VII."

G. Should Contractor, for any reason, fail to obtain and maintain the insurance required by this Agreement, CITY may obtain such coverage at Contractor's expense and deduct the cost of such insurance from payments due to Contractor under this Agreement or terminate pursuant to Section 7.

5. TIME FOR PERFORMANCE.

A. The Contractor will fully complete the Work within _____ working days (the "Contract Time.")

B. The Contract Time will commence when the City issues a Notice to Proceed. The Contract Documents will supersede any conflicting provisions included on the notice to proceed issued pursuant to this Contract.

C. The Contractor may not perform any Work until:

i. The Contractor furnishes proof of insurance as required by the Contract Documents; and

ii. The City gives the Contractor a written, signed, and numbered purchase order and Notice to Proceed.

D. By signing this Contract, the Contractor represents to the City that the Contract Time is reasonable for completion of the Work and that the Contractor will complete the Work within the Contract Time.

E. Should the Contractor begin the Work before receiving written authorization to proceed, any such Work is at the Contractor's own cost and risk.

6. DELAYS AND EXTENSIONS OF TIME.

A. General. Unless otherwise agreed in writing, an adjustment to the Contract Time by reason of a Change Order shall be agreed to at the time the Change Order is issued and accepted by Contractor.

B. Extensions of Time. In the event it is deemed appropriate by the City to extend the time for completion of the Work, any such extension shall not release any guarantee for the Work required by the Contract Documents, nor shall any such extension of time relieve or release the Sureties on the Bonds executed. In executing such Bonds, the Sureties shall be deemed to have expressly agrees to any such extensions of time. The amount of time allowed by an extension of time shall be limited to the period of the delay giving rise to the same as determined by the City. Notwithstanding any dispute which may arise in connection with a claim for adjustment of the Contract Time, the Contractor shall promptly proceed with the Work.

C. Payment for Delays. Notwithstanding any other terms and conditions of the Contract Documents, the City shall have no obligation whatsoever to increase the Contract Sum or extend the time for delays. Unless compensation and/or markup is agreed upon by the City, the Contractor agrees that no payment of compensation of any kind shall be made to the Contractor for damages or increased overhead costs caused by any delays in the progress of the Contract, whether such delays are avoidable or unavoidable or caused by any act or omission of the City or its agents. Any accepted delay claim shall be fully compensated for by an extension of time to complete the performance of the Work.

7. TERM AND TERMINATION. The Contract is effective as of the Effective Date stated in the first paragraph of this Contract and shall remain in full force and effect until the Contractor has fully rendered the services required by the Contract Documents or the Contract has been otherwise terminated by the City. However, some provisions may survive the term of the Contract, as stated in those provisions.

City may terminate this Contract at any time, at will, for any reason or no reason, after giving written notice to Contractor at least ten (10) calendar days before the termination is to be effective. If City defaults under this Agreement, and if City has not cured the default within thirty (30) calendar days after Contractor has given City notice of the event of default. Contractor may terminate this Contract for cause after giving written notice to City at least thirty (30) calendar days before the termination is to be effective. Contractor shall cease all work under this Contract on or before the effective date of termination specified in the notice of termination. Contractor shall be paid for services satisfactorily rendered to the last working day this Contract is in effect and Contractor shall deliver all materials, reports, documents, notes or other written materials compiled

through the last working day this Contract is in effect. In no event shall Contractor be entitled to receive more than the maximum compensation set forth in this Contract that would be paid to the Contractor for the full performance of the services required by this Contract. Neither party shall have any other claim against the other party by reason of such termination. In the event the City terminates the Contract, Contractor shall be reimbursed for all unavoidable and unmitigable costs resulting from such termination, in addition to the compensation for all work completed up until the effective date of the termination of the Contract.

8. **PERMITS AND LICENSES.** Before starting any construction work, the Contractor will be required to obtain all necessary permits, licenses or certificates from the City and shall maintain such permits, licenses and certificates required to complete the Work during the Contract Time. Contractor shall bear all costs for fees for all agencies except for the City's permit fees.

9. **COOPERATION AND COLLATERAL WORK**. The Contractor shall be responsible for coordinating all Work with the City's Street sweeping, trash pick-up, and street maintenance contractors, emergency services departments, utility company crews, and others when necessary. Payment for conforming to these requirements shall be included in other items of Work, and no additional payment shall be made thereof.

10. **EXTRA WORK.** New and unforeseen work will be classified as Extra Work only when the Work is not covered and cannot be paid for under any of the various items or combination of items for which a Bid price appears on the Bid. The Contractor shall not do any Extra Work except upon written order from the City Manager.

11. **ASSIGNMENT.** Any purported assignment without written consent of the City shall be null, void, and of no effect, and the Contractor shall hold harmless, defend and indemnify the City and its officers, officials, employees, agents and representatives with respect to any claim, demand, or action arising from or relating to any unauthorized assignment.

    If the city opts to consent to assignment, the City's consent shall be contingent upon: (1) a letter from the Surety agreeing to the assignment and assigning all of the Bonds to the assignee without any reduction, or the assignee supplying all new Bonds in the amounts originally required under the Contract Documents; and (2) the assignee supplying all of the required insurance in the amounts required in the Contract Documents. Until the Surety assigns all of the Bonds or the assignee supplies all of the new Bonds, and until the assignee supplies all of the required insurance, an assignment otherwise consented to in writing by the City shall not be effective. Even if the City consents to assignment, no assignment shall relieve the Contractor from liability under the Contract.

12. **INSPECTION.** The Contractor shall arrange and pay for all off-site inspection of the Work required by any ordinance or governing authorities. The Contractor shall also arrange and pay for other inspections, including tests in connection therewith, as may be assigned or required.

13. WORKSITE MAINTENANCE.

A. General. Clean-up shall be done as Work progresses at the end of each day and thoroughly before weekends. The Contractor shall not allow the Work site to become littered with trash and waste material but shall maintain the same in a neat and orderly condition throughout the construction operation. Materials which need to be disposed shall not be stored at the Work site but shall be removed by the end of each working day. If the job site is not cleaned to the satisfaction of the City Manager, the cleaning will be done or contracted by the City and shall be back-charged to the Contractor and deducted from the Contract Sum.

The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the City will be withheld until the Contractor has satisfactorily complies with the foregoing requirements for final clean-up of the Work site.

B. Storage of Equipment and Materials. The Contractor shall make arrangements for storing its equipment and materials. The Contractor shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the Work. Approved areas within Work site may be used for temporary storage; however, the Contractor shall be responsible for obtaining any necessary permits from the City. Construction materials and equipment shall not be stored in streets, roads, or highways unless otherwise approved by the City Manager.

C. All costs associated with the clean-up and storage required to complete the Work shall be the sole responsibility of the Contractor.

14. WARRANTY. For purposes of the calculation of the start of the warranty period, the Work shall be deemed completed upon the date of the Notice of Completion. If that direction is contingent on the completion of any items remaining on a punch list, the Work shall be deemed to be completed upon the date of the City Manager's acceptance of the final item(s) on the punch list. The Contractor shall repair or replace defective materials and workmanship at its own expense. Additionally, the Contractor agrees to defend, indemnify, and hold harmless the City from claims or any kind arising from damage, injury, or death due to such defects. The parties agree that no certificates given shall be conclusive evidence of the faithful performance of the Contract, either in whole or in part, and that no payment shall be construed to be in acceptance of any defective Work or improper materials. Further, the certificate or final payment shall not terminate the Contractor's obligations under the warranty herein.

15. CONTRACTOR'S RESPONSIBILITY FOR WORK. Until the final acceptance of the Work by the City, the Contractor shall have the charge and care thereof and shall bear

the risk of injury or damage to any part of the Work by the action of the elements, criminal acts, or any other cause. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries or damages arising from the sole negligence or willful misconduct of the City, its officers, agents or employees. In the case of suspension of Work from any cause whatsoever, the Contractor shall be responsible for all materials and the protection of Work already completed, shall properly store and protect them if necessary, and shall provide suitable drainage and erect temporary structures where necessary. The Contractor is prohibited from performing work with a subcontractor who is debarred pursuant to Labor Code §§ 1777.1 or 1777.7.

16. **DISPUTES**. Disputes arising from this contract will be determined in accordance with the Contract Documents and Public Contracts Code §§ 10240-10240.13.

17. **THIRD PARTY CLAIMS**. In accordance with Public Contracts Code § 9201, the City will promptly inform the Contractor regarding third-party claims against the Contractor, but in no event later than 10 business days after the City receives such claims. Such notification will be in writing and forwarded in accordance with the "Notice" section of the Contract Documents. As more specifically detailed in the Contract Documents, the Contractor agrees to indemnify and defend the City against any third- party claim.

18. **TAXPAYER IDENTIFICATION NUMBER**. The Contractor will provide the City with a Taxpayer Identification Number.

19. **OWNERSHIP OF DOCUMENTS.** All documents, data, studies, drawings, maps, models, photographs and reports prepared by the Contractor under the Contract Documents are the City's property. The Contractor may retain copies of said documents and materials as desired, but will deliver all original materials to the City upon the City's written notice.

20. **INDEMNIFICATION.** To the maximum extent permitted by law, the Contractor hereby agrees at its sole cost and expense, to defend, protect, indemnify, and hold harmless the City, its elected and appointed officials, officers, employees, volunteers, attorneys, agents (including those City agents serving as independent contractors in the role of City representative), successors, and assignees (collectively "Indemnitees") from and against any and all claims (including, without limitation, claims for bodily injury, death or damage to property), demands, charges, obligations, damages, causes of action, proceedings, suits, losses, stop payment notices, judgments, fines, liens, penalties, liabilities, costs and expenses of every kind and nature whatsoever, in any manner arising out of, incident to, related to, in connection with or resulting from any act, failure to act, error or omission of the Contractor or any of its officers, agents, attorneys, employees, subcontractors, material supplies or any of their officers, agents or employees and/or arising out of, incident to, related to, in connection with or resulting from any term, provision, image, plan, covenant, or condition in the Contract Documents, including, without limitation, the payment of all consequential damages, attorneys' fees, experts'

fees, and other related costs and expenses (individually a "Claim", or collectively, "Claims"). The Contractor shall promptly pay and satisfy any judgment, award or decree that may be rendered against any of the Indemnitees as to any such Claim. The Contractor shall reimburse Indemnitees for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the Contractor or Indemnitees. This indemnity shall apply to all claims regardless of whether any insurance policies are applicable or whether the Claim was caused in part or contributed to by an Indemnitee.

Nonwaiver of Rights. Indemnitees do not and shall not waive any rights that they may possess against the Contractor because the acceptance by the City or the deposit with the city of any insurance policy or certificate required pursuant to these Contract Documents. This indemnity provision is effective regardless of any prior, concurrent, or subsequent active or passive negligence by Indemnitees and shall operate to fully indemnify Indemnitees against any such negligence.

Waiver of Right of Subrogation. The Contractor, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all Claims arising out of or incident to the activities or operations performed by or on behalf of the Contractor regardless of any prior, concurrent or subsequent active or passive negligence by Indemnitees.

Survival. The provisions of this Section 20 shall survive the term and termination of the Contract, are intended to be as broad and inclusive as is permitted by the law of the State, and are in addition to any other rights or remedies that Indemnitees may have under the law. Payment is not required as a condition precedent to an Indemnitee's right to recover under this indemnity provision, and an entry of judgment against the Contractor shall be conclusive in favor of the Indemnitee's right to recover under this indemnity provision.

21. **NONDISCRIMINATORY EMPLOYMENT.** The Contractor shall not unlawfully discriminate against any individual based on race, religion, creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender identity, gender expression, age, sexual orientation, or military and veteran status. The Contractor understands and agrees that it is bound by and will comply with the nondiscrimination mandates of all statutes and local ordinances and regulations.

22. **PREVAILING WAGES**. In accordance with Labor Code § 1770 et seq., the Project is a "public work" to which prevailing wages apply. The Contractor and any Subcontractors shall pay wages in accordance with the determination of the Director of the Department of Industrial Relations ("DIR") regarding the prevailing wage rate of per diem wages. The Contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. The project is subject to compliance monitoring and enforcement by the DIR.

23. **INDEPENDENT CONTRACTOR.** The City and the Contractor agree that the Contractor will act as an independent contractor and will have control of all work and the manner in which it is performed. The Contractor will be free to contract for similar service to be performed for other employers while under contract with the City. The Contractor is not an agent or employee of the City and is not entitled to participate in any pension plan, insurance, bonus or similar benefits the City provides for its employees. Any provision in this Contract that may appear to give the City the right to direct the Contractor as to the details of doing the work or to exercise a measure of control over the work means that the Contractor will follow the direction of the City as to end results of the work only.

24. **CONFLICTS OF INTEREST.** Contractor and its employees, associates and subcontractors, if any, shall comply with all California conflict of interest statutes applicable to Contractor's Work under this Contract, including, but not limited to the Political Reform Act (Gov. Code § 81000 et seq.) and Government Code § 1090.

25. **AUDIT OF RECORDS.** The Contractor will maintain full and accurate records with respect to all services and matters covered under this Contract. The City will have free access at all reasonable times to such records, and the right to examine and audit the same and to make transcript therefrom, and to inspect all program data, documents, proceedings and activities. The Contractor will retain such financial and program service records for at least three years after termination or final payment under the Contract Documents.

26. **NON-WAIVER OF TERMS, RIGHTS AND REMEDIES.** Waiver by either party of any one or more of the conditions of performance under the Contract Documents shall not be a waiver of any other condition of performance under the Contract Documents. In no event shall the making by the City of any payment to the Contractor constitute or be construed as a waiver by the City of any breach of covenant, or any default that may then exist on the part of the Contractor, and the making of any such payment by the City shall in no way impair or prejudice any right or remedy available to the City with regard to such breach or default.

27. **NOTICES**. All communications to either party by the other party will be deemed made when received by such party at its respective name and address as follows:

To Contractor:	To City:
Attn: _____	Attn: _____
Dept.: _____	Dept.: _____
Address: _____	Address: _____
Phone: _____	Phone:_____
Email: _____	Email: _____

Any such written communications by mail will be conclusively deemed to have been received by the addressee upon deposit thereof in the United States Mail, postage prepaid and properly addressed as noted above. In all other instances, notices will be deemed given at the time of actual delivery. Changes may be made in the names or addresses of persons to whom notices are to be given by giving notice in the manner prescribed in this paragraph.

28. **NO THIRD PARTY BENEFICIARY**. This Contract and every provision herein is for the exclusive benefit of the Contractor and the City and not for the benefit of any other party. There will be no incidental or other beneficiaries of any of the Contractor's or the City's obligations under this Contract.

29. **INTERPRETATION**. This Contract was drafted in, and will be construed in accordance with the laws of the State of California, and exclusive venue for any action involving this Contract will be in Los Angeles County.

30. **EFFECT OF CONFLICT**. In the event of any conflict, inconsistency, or incongruity between any provision of the Contract Documents, precedence will be as determined in the Standard Specifications.

31. **SEVERABILITY.** If any portion of the Contract Documents are declared by a court of competent jurisdiction to be invalid or unenforceable, then such portion will be deemed modified to the extent necessary in the opinion of the court to render such portion enforceable and, as so modified, such portion and the balance of this Contract will continue in full force and effect.

32. **AUTHORITY/MODIFICATION.** The Parties represent and warrant that all necessary action has been taken by the Parties to authorize the undersigned to execute this Contract and to engage in the actions described herein. This Contract may be modified by written amendment. The City's city manager, or designee, may execute any such amendment on the City's behalf.

33. **ENTIRE AGREEMENT.** This Contract, including the Contract Documents and any other documents incorporated herein by specific reference, represents the entire and integrated agreement between City and Contractor. This Contract supersedes all prior oral or written negotiations, representations or agreements. This Contract may not be modified or amended, not any provisions or breach waived, except in a writing signed by both parties that expressly refers to this Contract.

34. **ELECTRONIC SIGNATURES; SIGNATURE AUTHORITY**. This Contract may be executed by the Parties on any number of separate counterparts, and all such counterparts so executed constitute one agreement binding on all the Parties notwithstanding that all the Parties are not signatories to the same counterpart. In accordance with Government Code §16.5, the Parties agree that this Contract, agreements ancillary to this Contract, and related documents to be entered into in connection with this Contract will be considered signed when the signature of a party is delivered by electronic transmission.

Such electronic signature will be treated in all respects as having the same effect as an original signature. Contractor warrants that its signatory (or signatories, as applicable) to this Agreement has the legal authority to enter this Agreement and bind Contractor accordingly.

35. COVENANTS AND CONDITIONS. The parties agree that all of the provisions hereof will be construed as both covenants and conditions, the same as if the words importing such covenants and conditions had been used in each separate paragraph.

36. CAPTIONS. The captions of the paragraphs of this Contract are for convenience of reference only and will not affect the interpretation of this Contract.

37. TIME IS OF ESSENCE. Time is of the essence for each and every provision of the Contract Documents.

[*Signatures on following page*.]

IN WITNESS WHEREOF the parties hereto have executed this Contract the day and year first hereinabove written.

CITY OF EL SEGUNDO

_____
Darrell George,
City Manager

CONTRACTOR

_____
Name:
Title:

_____
Name:
Title:

Taxpayer ID No.

_____

Contractor State License No.

_____

Contractor City Business License No.

_____

ATTEST:

_____
Susan Truax,
City Clerk

APPROVED AS TO FORM:
MARK D. HENSLEY, City Attorney

By: _____
David King, Assistant City Attorney

Insurance Reviewed by: _____
Sharon Brennan, Risk Manager

FAITHFUL PERFORMANCE BOND

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Bond No.
Bond Fee:

_____ ("PRINCIPAL")

and _____, a corporation

incorporated under the laws of the State of _____ and licensed by the State of California to execute bonds and undertakings as sole surety, as surety ("SURETY"), are held and firmly bound unto the CITY OF EL SEGUNDO ("CITY") in the sum of _____ **DOLLARS** and _____ cents ($_____), lawful money of the United States, which may be increased or decreased by a rider hereto executed in the same manner as this bond, for the payment of which sum PRINCIPAL and SURETY bind themselves, their successors, and assigns, jointly and severally, by this instrument.

PRINCIPAL or SURETY will apply this bond for the faithful performance of any and all of the conditions and stipulations set forth in this bond, **SPECIFICATIONS NO. PW 26-05**, and the Public Works contract executed with such Specifications. In the case of any default in the performance of the conditions and stipulations of this undertaking, it is agreed that PRINCIPAL or SURETY will apply the bond or any portion thereof, to the satisfaction of any damages, reclamation, assessments, penalties, or deficiencies arising by reason of such default.

BOND CONDITIONS

1. PRINCIPAL will construct the public improvements identified in **SPECIFICATIONS NO. PW 26-05**, a copy of which is on file with CITY's Engineering Division ("Public Project"). Such performance will be in accordance with CITY's plans and profiles (**CITY DRAWING FILE NO. PW 26-05**) which are made a part of this bond when said plans and profiles are approved by the City Council and filed with CITY's Engineering Division. CITY has estimated the required amount of the bond as shown above.

2. PRINCIPAL's work on the Public Project will be done in accordance with CITY's plans and specifications and with any permit issued by CITY. Should PRINCIPAL fail to complete all required work within the time allowed, CITY may, at its sole discretion, cause all required work to be done and the parties executing the bond will be firmly bound for the payment of all necessary costs therefor.

3. PRINCIPAL will guarantee its work against any defective work, labor, or materials on the Public Project for a period of one (1) year following the Public Project's

completion and acceptance by CITY. Should PRINCIPAL fail to correct its work against any defective work, labor, or materials, CITY may, at its sole discretion, cause all required work to be done and the parties executing the bond will be firmly bound for the payment of all necessary costs therefor.

4. This bond is conditioned upon and guarantees due compliance with all applicable law including, without limitation, the El Segundo Municipal Code ("ESMC").

5. SURETY, for value received, agrees that no changes, extensions of time, alteration or modification of **SPECIFICATIONS NO. PW 26-05** or of the obligation to be performed will in any way affect its obligation on this bond, and it waives notice of any such change, extension of time, alteration or modification of the contract documents or of the obligation to be performed.

6. This bond consists of this instrument; the plans and specifications identified above; and the following two (2) attached exhibits all of which are incorporated herein by reference:

A. A certified copy of the appointment, power of attorney, bylaws or other instrument entitling or authorizing the persons executing this bond to do so;

B. A certificate issued by the county clerk for the county in which SURETY's representative is located conforming with California Code of Civil Procedure § 995.640 and stating that SURETY's certificate of authority has not been surrendered, revoked, cancelled, annulled, or suspended, or in the event that it has, that renewed authority has been granted; and

7. Should PRINCIPAL perform its obligations within the time allowed, PRINCIPAL's obligation will be void one (1) year following the acceptance of the performance by CITY; otherwise this obligation will remain in full force and effect.

[SIGNATURES ON FOLLOWING PAGE]

SIGNED AND SEALED this _____ day of _____, 20_____.

PRINCIPAL's PRESIDENT SURETY's PRESIDENT

PRINCIPAL's SECRETARY SURETY's SECRETARY

PRINCIPAL's MAILING ADDRESS:	**SURETY's MAILING ADDRESS:**

NOTE: (1) ALL signatures must be acknowledged by a notary public. Return one (1) original to City Clerk's Office.

(2) Bond shall be effective for one (1) year after acceptance of the job.

LABOR AND MATERIALS BOND

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

Bond No.
Bond Fee:

_____, as principal

("PRINCIPAL") and _____, a corporation

incorporated under the laws of the State of _____ and licensed by the State of California to execute bonds and undertakings as sole surety, as surety ("SURETY"), are held and firmly bound unto the CITY OF EL SEGUNDO ("CITY") in the sum of _____ **DOLLARS** and ____ cents ($_____), lawful money of the United States, which may be increased or decreased by a rider hereto executed in the same manner as this bond, for the payment of which sum PRINCIPAL and SURETY bind themselves, their successors, and assigns, jointly and severally, by this instrument.

This bond is conditioned upon and guarantees payment by PRINCIPAL to contractors, subcontractors, and persons renting equipment; payment by PRINCIPAL and all PRINCIPAL'S subcontractors for all materials, provisions, provender, or other supplies, and equipment used in, upon, for or about the performance of the work contemplated in **SPECIFICATIONS NO. PW 26-05** ("Public Project"), the Public Works contract executed for such Public Project, and for all work or labor of any kind performed for the Public Project. In the case of any default in the performance of the conditions and stipulations of this undertaking, it is agreed that PRINCIPAL or SURETY will apply the bond or any portion thereof, to the satisfaction of any damages, reclamation, assessments, penalties, or deficiencies arising by reason of such default.

BOND CONDITIONS

1. PRINCIPAL will construct the public improvements identified in **SPECIFICATIONS NO. PW 26-05,** and the Public Works contract executed for such Specifications, copies of which is on file with CITY's Engineering Division ("Public Project"). Such performance will be in accordance with CITY's plans and profiles (**CITY DRAWING FILE NO. PW 26-05**), which are made a part of this bond when said plans and profiles are approved by the City Council and filed with CITY's Engineering Division.

2. PRINCIPAL will pay all contractors, subcontractors, and persons renting equipment.

3. PRINCIPAL will pay for all materials and other supplies, for equipment used in, on, for or about the performance of the Public Project, and will pay for all work and labor

thereon.

4. This bond is conditioned upon and guarantees due compliance with all applicable law including, without limitation, the El Segundo Municipal Code ("ESMC").

5. SURETY, for value received, agrees that no changes, extensions of time, alteration or modification of **SPECIFICATIONS NO. PW 26-05,** or of the obligation to be performed will in any way affect its obligation on this bond, and it waives notice of any such change, extension of time, alteration or modification of the contract documents or of the obligation to be performed.

6. This bond consists of this instrument; the plans and specifications identified above; and the following TWO (2) attached exhibits all of which are incorporated herein by reference:

A. A certified copy of the appointment, power of attorney, bylaws or other instrument entitling or authorizing the persons executing this bond to do so; and

B. A certificate issued by the county clerk for the county in which SURETY's representative is located conforming with California Code of Civil Procedure § 995.640 and stating that SURETY's certificate of authority has not been surrendered, revoked, cancelled, annulled, or suspended, or in the event that it has, that renewed authority has been granted.

7. Should PRINCIPAL perform its obligations within the time allowed, PRINCIPAL's obligation will be void upon the acceptance of the performance by CITY; otherwise this obligation will remain in full force and effect.

[SIGNATURES ON FOLLOWING PAGE]

SIGNED AND SEALED this _____ day of _____, 20_____.

PRINCIPAL's PRESIDENT	SURETY's PRESIDENT
PRINCIPAL's SECRETARY	SURETY's SECRETARY
PRINCIPAL's MAILING ADDRESS:	**SURETY's MAILING ADDRESS:**
_____	_____
_____	_____
_____	_____
_____	_____

NOTE: (1) ALL signatures must be acknowledged by a notary public.
Return one (1) original to City Clerk's Office.

SECTION II - GENERAL REQUIREMENTS

CITY OF EL SEGUNDO
PUBLIC WORKS DEPARTMENT

GENERAL SPECIFICATIONS

1. REGISTRATION OF CONTRACTORS

   No bid will be accepted from a **Contractor** who has not been licensed in accordance with the provisions of the laws of the State of California relating to licensing of contractors, for the type of work to be performed under this Contract.

2. INSURANCE AND CITY BUSINESS LICENSE

   Contractor and **Subcontractors** will obtain appropriate insurance and a City Business License before execution of the construction contract.

3. EMERGENCY INFORMATION

   The names, addresses and telephone numbers of the **Contractor** and **Subcontractors**, or their representatives, will be filed with the City Engineer and the City Police Department **BEFORE PERFORMING WORK.**

4. FURNISHING OF WATER

   Water necessary for the prosecution of the work as herein specified will be furnished by the City in the following manner:

   The **Contractor** will deposit with the City Water/Wastewater Division the sum of **One Thousand Four Hundred Forty-Four Dollars ($1,444.00)** to insure against damage to a 2 ½" Fire Hydrant water meter, which will be furnished and installed by the City at a point convenient to the site of the work. This deposit will be refunded to the **Contractor** upon completion of the Project if, after removal and inspection of said meter by the City, it is found to be in satisfactory condition. In event of damage to this meter while under the jurisdiction of the **Contractor**, all or any part of said deposit may be retained by the City.

   A non-refundable Activation Fee of **One Hundred and Fifty-Six Dollars ($156.00)** will be charged to the **Contractor** upon activation of the temporary meter. All water used from the temporary meter will be metered and charged to the **Contractor** at the prevailing rate plus the current daily meter rental rate. The **Contractor** will be charged a $15 reconnect fee if the **Contractor** wishes the City to relocate the temporary meter to another hydrant.

   Cost of water to be used shall be included in the Contract bid price of the items of work relevant to its use.

5. CALIFORNIA - OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

All work performed under this contract will be done in strict compliance with the Cal-OSHA Rules and Regulations, latest edition.

6. SOUND CONTROL

The **Contractor** will comply with all local sound control and noise level rules, regulations and ordinances that apply to any work performed pursuant to the contract.

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

The use of loud signals will be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

7. AIR POLLUTION CONTROL

The Contractor is put on notice that he must abide by all existing rules and regulations of the SCAQMD (South Coast Air Quality Management District), relating to all operations or equipment which discharge visible emissions or solid or liquid particles to the atmosphere.

8. WORKER UNIFORMS

All workers under the employment of the **Contractor** or his/her **Subcontractor** shall wear the appropriate safety apparel as required by the latest edition of the Work Area Traffic Control Handbook (WATCHBOOK) while working in the public right-of way. Workers shall wear the correct Class visibility apparel for the speed zone working in, as required in the WATCHBOOK.

CITY OF EL SEGUNDO
PUBLIC WORKS DEPARTMENT

SUPPLEMENTAL PROVISIONS

PART 1
GENERAL PROVISIONS

SECTION 1 - GENERAL

0-0 STANDARD SPECIFICATIONS

0-1 GENERAL

Except as modified by these Supplemental Provisions, the provisions of the latest edition of the "Standard Specifications for Public Works Construction" ("Greenbook") and its supplements prepared and promulgated by Public Works Standards, Inc. Public Works, constitute the Standard Specifications for this Project.

0-2 NUMBERING OF SECTIONS

The numbering contained within the Standard Specifications of the Contract Documents is intended to correspond with Greenbook numbering.

1-2 TERMS AND DEFINITIONS

Add or delete the following to Subsection 1-2 of the Greenbook.

Acceptance – In the context of "acceptance" of the work, the date on which the *City Council* accepts the Work as complete.

City - City of El Segundo

City Council - The body constituting the awarding authority of the City.

Compensable Delay - a delay entitling the Contractor to an adjustment of the Contract Sum and an adjustment of the Contract Time in accordance with this Agreement.

Due Notice - A written notification, given in due time, of a proposed action where such notification is required by the contract to be given a specified interval of time (usually 48 hours or two working days) before the commencement of the contemplated action. Notification may be from Engineer to Contractor or from Contractor to Engineer.

Engineer - The City Engineer, or designee, as defined in the Greenbook. Unless

otherwise provided, all correspondence and decisions made relative to the contract will be by the City Engineer or his designated representative.

Prompt - The briefest interval of time required for a considered reply, including time required for approval of a governing body.

Public Works Director – The City's Public Works Director, or designee.

State Standard Specifications - State of California Standard Specifications, latest edition and supplements, California State Transportation Agency, Department of Transportation (Caltrans)

Working Days - A working day is defined as any day, except Saturdays, Sundays, legal holidays and days when work is suspended by the Engineer (non-working), as provided in Subsection **6-3 TIME OF COMPLETION.**

1-3 ABBREVIATIONS

Add the following to Subsection 1-3 of the Greenbook.

1-3.1 Common Usage

Public Works	Public Works
NTP	Notice to Proceed
WATCH	Work Area Traffic Control Handbook
SSPWC	Standard Specifications for Public Works Construction by Public Works Standards, Inc.
CITY	City of El Segundo

1-3.2 Institutions

AAN	American Association of Nurserymen
AGC	Associated General Contractors of America
AISC	American Institute of Steel Construction
APWA	American Public Works Association
ASA	American Standard Association
ASME	American Society of Mechanical Engineers
IEEE	Institute of Electric and Electronic Engineers
NEC	National Electric Code
PCC	California Public Contract Code

1-6 BIDDING AND SUBMISSION OF THE BID

Subsection 1-6 Bidding and Submission of the Bid of Greenbook is deleted in its entirety and replaced with the following subsection.

1-6.1 General

Except as provided in PCC §§ 4100 et. seq., each bidder will file with its bid the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specifically 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 prime contractor's total bid. Only one subcontractor will be listed for each portion of the work, which portion will be defined in the bid. In each instance, the nature and extent of the work to be sublet will be described. The failure of the Contractor to specify a subcontractor, or the listing of more than one subcontractor for the same portion of the work, constitutes an agreement by the Contractor that it is fully qualified to perform that portion itself and that it will perform that portion itself.

The Contractor must have the City Council's written consent to substitute a subcontractor other than that designated in the original bid, to permit any subcontract to be assigned or transferred, or to allow a subcontract to be performed by other than the original subcontractor.

Subcontracting of work for which no subcontractor was designated in the original bid, and which is more than one-half of one percent of the work, will be allowed only in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the City Council setting forth the facts constituting the emergency or necessity.

Violation of any of the above provisions will be considered a breach of the Contract, and the City may terminate the Contractor's control over the Work, cancel the contract, or assess the Contractor a penalty of not more than ten percent of the subcontract involved.

All persons engaged in the work, including subcontractors and their employees will be considered as employees of the Contractor. The Contractor will be solely responsible for and have control over construction means, methods, techniques, sequences, procedures, and the coordination of all portions of the Work. The City will deal directly with, and make all payments to, the prime Contractor.

When subcontracted work is not being prosecuted in a satisfactory manner, the Contractor will be notified to take corrective action. The Engineer may report the facts to the City Council. If the City Council so orders, and on receipt by the Contractor of

written instructions from the Engineer, the subcontractor will be removed immediately from the Work. That subcontractor will not again be employed on the Work.

If licensure or proper licensure is controverted, then proof of licensure pursuant to this section must be made by production of a verified certificate of licensure from the Contractors' State License Board which establishes that the individual or entity bringing the action was duly licensed in the proper classification of contractors at all times during the performance of any act or contract covered by the action. Nothing in this subdivision requires any person or entity controverting licensure or proper licensure to produce a verified certificate. When licensure or proper licensure is controverted, the burden of proof to establish licensure or proper licensure is on the licensee.

1-6.3 Additional Responsibility

Add the following to Subsection 1-6.2 Additional Responsibility:

The Contractor will submit experience statements for each subcontractor who will perform contract work that amounts to more than ten percent (10%) of the Work.

1-7 AWARD AND EXECUTION OF THE CONTRACT

1-7.2 Contract Bonds

Delete Paragraph four (4) of the Subsection and insert:

The "Performance Bond" shall be for 100% of the Contract Price to guaranty faithful performance of all work, within the time prescribed, in a manner satisfactory to the City, and that all materials and workmanship will be free from original or developed defects. The Faithful Performance Bond and the Labor and Materials Bond must be paid and in effect for one year after the acceptance of the job by the City in accordance with the guarantee required by Subsection 3-13.1.

SECTION 2 – SCOPE OF THE WORK

2.1 WORK TO BE DONE

Add following subsections:

2-1.1 Access to Project Site

Not later than the date designated in the City's Notice to Proceed (NTP), the City will provide access to the real property and facilities upon which the Work is to be performed, in accordance to the Contract Documents for the Contractor's use.

2-1.2 Ownership and Use of Contract Documents

The Contract Documents and all copies furnished to or provided by the Contractor are the City's property and may not be used for other work.

2-2 PERMITS

Add the following paragraph to Subsection 2-2:

The Contractor will apply for permits required by the City. These permits will be issued on a "no-fee" basis.

The Contractor must pay for and obtain all other permits from other governmental and utility agencies necessitated by their operations.

All bonding fees, permit, inspection permit fees or other fees, such as, but limited to, overweight and oversized vehicle permit fees, charges and/or required for the completion of the Contract Work must be paid by the Contractor. These costs shall be included in the bid item provided. If no bid item is included, costs will be included in the various items of work, and no additional payment will be allowed.

2-3 RIGHT-OF-WAY

Add the following subsection to Subsection 2-3:

2-3.1 Additional Work Areas and Facilities

When the Contractor arranges for additional temporary work areas and facilities, the Contractor will provide the City with proof that the additional areas or facilities have been left in a condition satisfactory to the owner(s) of said work areas or facilities before acceptance of the work.

2-9 CHANGED CONDITIONS.

Delete Subsection 2-9 and replace with the following:

If the Contractor encounters concealed or unknown conditions that differ materially from those anticipated or expected ("changed conditions"), the Contractor will *immediately* notify the Engineer in writing of such changed conditions (upon discovery and before disturbing such changed conditions), as provided in Subsection 6-11 of these Supplemental Provisions, so that the Engineer can determine if such conditions require design details that differ from those design details shown in the Contract Documents. Notwithstanding the time period (thirty (30) days) set forth in Subsection 6-11.3, Claims Submitted to Engineer, the Contractor is liable to the City for any extra costs incurred as a result of the Contractor's failure to promptly give such notice.

Changed conditions include, without limitation, the following:

1. Subsurface or latent physical conditions differing materially from those represented in the Contract Documents;

2. Unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character being performed; and

3. Material differing from what is represented in the Contract which the Contractor believes may be hazardous waste as defined in California Health & Safety Code §25117 that is required to be removed to a Class I, II, or III disposal site in accordance with applicable law(s).

The Engineer will promptly investigate conditions that appear to be changed conditions and render a decision promptly. The Engineer's decision, and any dispute regarding that decision, will be made in accordance with Section 6-11, DISPUTES AND CLAIMS; PROCEDURE (of these Supplemental Provisions).

Any information provided pursuant to INFORMATION AVAILABLE TO BIDDERS is subject to the following provisions:

1. The information is made available for the Bidders' convenience and *is not a part* of the Contract.

2. The City has not determined the accuracy or completeness of such information and all such information is made available to Bidders without any representation or warranty by the City whatsoever as to its accuracy, completeness, or relevancy.

3. Bidders will independently evaluate such information for their use and will be solely responsible for use or interpretation of such information. Any such use or interpretation will not be the basis of any claim against the City.

2-10 DISPUTED WORK

Delete Subsection 2-10 and replace with the following:

If the Contractor and the City do not reach agreement on disputed work, the City may direct the Contractor to proceed with the work. Any payment for the disputed work will be determined pursuant to the claims procedures in these Supplemental Provisions. Although not to be construed as proceeding under extra work provisions, the Contractor will keep and furnish records of disputed work as required by the Contract Document.

SECTION 3 – CONTROL OF THE WORK

3-7 CONTRACT DOCUMENTS

Delete Subsection 3-7.1 and replace with the following: subsection.

3-7.1 General

The Contractor will maintain the following at the Work site:

1. Maintain one (1) as-built copy of the Project Plans and Specifications, in good order, complete and current with, clearly defined markings, to record all approved changes and selections made during construction. The As-built plans must be submitted to the City representative for approval before the City pays a final retention amount.

2. The current accepted Contract Schedule.

3. Shop Drawings, Product Data, and Samples. Copy of approved change documents (RFI, submittal, designer supplemental instructions and approved change orders, this is a partial listing of actual change documents, titles may vary from Project to Project).

4. All approved permits, including those issued by other agencies. Cal-OSHA permits for trench shoring shall be available for review on site, when requested.

5. All other required submittals.

The Plans, Specifications, and other Contract Documents will govern the Work. The Contract Documents are intended to be complementary and cooperative and to describe and provide for a complete project. Anything in the Specifications and not on the Plans, or on the Plans and not in the Specifications, will be as though shown or mentioned in both.

Payment for any items on the plans for which there is no specific bid item will be included in the various items of work or in any item to which it is appurtenant.

If the Contractor performs any work which it knows or should know involves an error, inconsistency, or omission without notifying and obtaining written consent from the Engineer, the Contractor will be responsible for the resulting losses, including, without limitation, the costs of correcting defective work.

3-7.2 Precedence of Contract Documents

The following paragraph is added to subsection 3-7.2 of the Greenbook:

As the figured dimensions shown on the plans and in the specifications of the Contract may not in every case agree with scaled dimensions, the figured dimensions will be followed in preference to the scaled dimensions, and plans to a large scale will be

followed in preference to the plans to a small scale. Should it appear that the work to be done, or any of the matters relative thereto, are not sufficiently detailed or explained in the Contract, the Contractor will apply to the Engineer for such further explanations as may be necessary, and will conform thereto as part of the Contract so far as may be consistent with the terms thereof. Any items shown on drawings and not mentioned in the specifications will be of like effect as if shown or mentioned in both.

3-7.3 Accuracy of Plans and Specifications

Add the following subsection:

Although it is believed that much of the information pertaining to conditions and existing utilities that may affect the cost of the Work will be shown on the Plans or indicated in the Specifications, the City does not warrant the completeness or accuracy of such information. The Contractor is responsible for contacting 811 – Dig Alert prior to the commencement of the Contract Work and maintaining the status of the notice.

The Contractor will carefully study and compare each of the Contract Documents with the others and with information furnished by the City and will promptly report in writing to the Engineer any errors, inconsistencies, or omissions in the Contract Documents or inconsistencies with applicable law observed by the Contractor.

The Contractor will take field measurements, verify field conditions, perform soil investigations, and carefully compare with the Contract Documents such field measurements, conditions, and other information known to the Contractor before commencing the Work. Errors, inconsistencies, or omissions discovered at any time will be promptly reported in writing to the Engineer.

3-10 SURVEYING

Add the following Subsection 3-10.3, Survey Service:

3-10.3 Survey Service

3-10.3.1 Construction Surveying

The Contractor will provide for all construction surveys required to layout, monitor and complete the work. The surveys shall be performed by a Land Surveyor or Civil Engineer authorized to practice land surveying by the State of California.

Computations, survey notes, and other data used to accomplish the work will be neat, legible and accurate. Copies of all computations, survey notes, and other data (electronic format may be required) will be furnished to the Engineer before beginning work that requires their use.

The Project Benchmark is shown on the plans. The Contractor will establish all

necessary control lines based on the plans and record information on file with the County of Los Angeles Surveyor and the Engineer.

It is the responsibility of the Contractor to protect the survey control as shown on the plans. If the survey control is destroyed or disturbed during construction, the Contractor shall be responsible for resetting them and to file appropriate documents with the County of Los Angeles, at the direction of the Engineer.

3-10.3.2 Measurement and Payment

Construction Survey – Unless a separate bid item is provided, payment shall be considered to be included in the other items of the bid and no additional payment will be made therefore.

3-12 WORK SITE MAINTENANCE

Delete Subsection 3-12.1, General and replace with the following:

3-12.1 Cleanup and Dust Control

3-12.1.1 General

On any construction Project requiring trenching within public streets and for which total trenching is in excess of 500 feet, the Contractor will be required to sweep the worksite utilizing a pick-up type street sweeper a minimum of once daily.

3-12.1.2 Watering

Water for dust control caused by Contractor's operations or the passage of traffic through the work will be applied as necessary or as directed by the Engineer. Water for the above or other purposes may be obtained from any approved source. If the Contractor chooses to use a City fire hydrant upon placing deposits and fees as described in this contract, the Engineer will cause a meter to be installed. All water used from the hydrant will be metered and charged to the Contractor at the prevailing rate plus the current daily meter rental rate. The Contractor will be charged a $15 reconnect fee if the Contractor wishes to move the meter to a different hydrant.

Payment for the costs of water to be used shall be included in the cost of various associated bid items.

3-12.6 Water Pollution Control

The following requirements are added to establish storm water and urban runoff pollution prevention controls.

(a) Storm or construction generated water containing sediment such as,

construction waste, soil, slurry from concrete/asphalt concrete saw cutting operations, clean up of concrete transit mixers or other pollutants from construction sites and parking areas will be retained or controlled on site and will not be permitted to enter the storm drain system.

(b) Temporary sediment filtering systems such as sandbags, silt fences, or gravel berms will be utilized to trap sediment so that only filtered water enters the City's storm drain system. Proper clean up and disposal of settled sediment and the filtering system will be the responsibility of the Contractor.

(c) Discharge of concrete transit mixer wash water on to approved dirt areas (sub-grade area designated for new concrete construction for example) is acceptable. Discharge on to private property, parkway areas, or the street is not permitted.

(d) Plastic or other impervious covering will be installed where appropriate to prevent erosion of an otherwise unprotected area, along with any other runoff control devices deemed appropriate by the City.

(e) Excavated soil stored on the site will be covered in a manner that minimizes the amount of sediments running into the storm drain system, street or adjoining properties.

(f) No washing of construction or other industrial vehicles and equipment will be allowed adjacent to a construction site. During the rainy season (October 15 to April 15), Contractor will keep at the construction site sufficient materials and labor to install temporary sediment filtering systems and other water pollution prevention control measures. These control measures will be in place and maintained by the Contractor on a daily basis on days when construction is not in progress due to rain.

(g) All costs associated with water pollution control will be borne by the Contractor. Any expense incurred by the City to expeditiously respond to storm drain contamination resulting from Contractor’s failure to implement water pollution control measures will be charged to the Contractor.

3-12.7 Protection and Restoration of Existing Improvements

The following requirements are added to Section 3-12:

Where existing traffic striping, pavement markings, and curb markings are damaged or their reflectively reduced by the Contractor’s operations, such striping or markings will also be considered as existing improvements and the Contractor will replace such improvements.

Relocations, repairs, replacements, or re-establishments will be at least equal to the existing improvements and will match such improvements in finish and dimensions

unless otherwise specified.

Payment shall be included in corresponding Bid Items.

3-12.7 Public Convenience and Safety

Insert the following Subsection to Section 3-12:

Unless otherwise specified all traffic control will be performed in accordance with the Work Area Traffic Control Handbook (WATCH) Latest Edition, published by BNi Building News, 990 Park Center Drive, Suite E, Vista, CA (760) 734-1113/www.bnibooks.com.

3-12.8.1 Traffic and Access

The Contractor will notify the occupants of all affected properties at least 48 hours before any temporary obstruction of access. Vehicular access to property line will be maintained except as required for construction for a reasonable period of time. No overnight closure of any driveway will be allowed except as permitted by the Engineer.

At least one (1) twelve (12) foot wide traffic lane will be provided for each direction of travel on all streets at all times except as permitted by the Engineer. The traffic lanes will be maintained on pavement, and will remain unobstructed. All work requiring that a lane be closed or a lane moved right or left will be noticed to the traveling public by use of City approved lighted arrow boards.

Clearances from traffic lanes will be five (5) feet to the edge of any excavation and two (2) feet to the face of any curb, pole, barricade, delineator, or other vertical obstruction.

One four (4) foot wide paved pedestrian walkway will be maintained in the parkway area on each side of all streets. The clearance from the pedestrian walkway to any traffic lane will be five (5) feet. Pedestrians and vehicles will be protected from all excavations, material storage, and/or obstructions by the placement of an adequate number of lighted barricades (minimum two (2)) at each location, one (1) at each end of the obstruction or excavation), which will have flashing lights during darkness. Barricades will be Type I or Type II per Section 7-3 of the WATCH Manual and lights will be Type A per Section 7-6 of the "Work Area Traffic Control Handbook" (WATCH).

3-12.8.2 Street Closures, Detours, Barricades

Street closures will not be allowed except as specifically permitted by the Engineer.

The Contractor will prepare any traffic control or detour plans that may be required as directed by the Engineer. Lane transitions will not be sharper than a taper of thirty (30) to one (1).

Temporary traffic channelization will be accomplished with barricades or delineators. Temporary striping will not be allowed unless specifically permitted by the Engineer. The Contractor will prepare any plans that may be required for temporary striping to the satisfaction of the Engineer. In no event will temporary striping be allowed on finish pavement surfaces, which are to remain.

Where access to driveway or street crossings need to be maintained, minimum 1 1/4 inch thick steel plating will be used to bridge the trench. All steel plating will have temporary asphalt concrete 1:12 minimum sloped ramps to assist vehicles to cross comfortably over the plates and have a non-skid surface. Plates subject to vehicle high traffic speeds and in residential areas will be secured by welding at the discretion of the Engineer.

3-12.8.3 Protection of the Public

It is part of the service required of the Contractor to make whatever provisions are necessary to protect the public. The Contractor will use foresight and will take such steps and precautions as his operations warrant to protect the public from danger, loss of life or loss of property, which would result from interruption or contamination of public water supply, interruption of other public service, or from the failure of partly completed work or partially removed facilities. Unusual conditions may arise on the Project which will require that immediate and unusual provisions be made to protect the public from danger, loss of life, or damage to person and property, due directly or indirectly to prosecution of work under this contract.

Whenever, in the opinion of the Engineer, an emergency exists against which the Contractor has not taken sufficient precaution for the public safety, protection of utilities and protection of adjacent structures or property, which may be damaged by the Contractor's operations and when, in the opinion of the Engineer, immediate action will be considered necessary in order to protect the public or property due to the Contractor's operations under this contract, the Engineer will order the Contractor to provide a remedy for the unsafe condition. If the Contractor fails to act on the situation immediately, the Engineer may provide suitable protection to said interests by causing such work to be done and material to be furnished as, in the opinion of the Engineer, may seem reasonable and necessary.

The cost and expense of said labor and material, together with the cost and expense of such repairs as are deemed necessary, will be borne by the Contractor. All expenses incurred by the City for emergency repairs will be deducted from the progress payments and the final payment due to the Contractor. Such remedial measures by the City will not relieve the Contractor from full responsibility for public safety.

3-13 COMPLETION AND ACCEPTANCE

Delete Subsection 3-13 of the Greenbook is deleted in its entirety and replace with the

following:

The Work will be inspected by the Engineer for acceptance upon the Engineer receiving the Contractor's written assertion that the Work is complete.

If, in the Engineer's judgment, the Work is complete and is ready for acceptance, the Engineer will accept the Work on behalf of the City in the manner prescribed by the City. The Engineer will recommend approval of the Notice of Completion to the City Council. This will be the date when the Contractor is relieved from responsibility to protect the Work.

All work will be guaranteed by the Contractor against defective workmanship and materials furnished by the Contractor for a period of 1 year from the date the Work was completed. The Contractor will replace or repair any such defective work in a manner satisfactory to the Engineer, after notice to do so from the Engineer, and within the time specified in the notice. If the Contractor fails to make such replacement or repairs within the time specified in the notice, the City may perform this work and the Contractor's sureties will be liable for the cost thereof.

3-13.1 General Guaranty

The Contractor will remedy any defects in the work and pay for any damage to other nearby improvements resulting therefrom, which will appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The owner will give notice of observed defects with reasonable promptness.

SECTION 4 – CONTROL OF MATERIALS

4-3 INSPECTION

Delete Subsection 4-3 and replace with the following:

4-3.1 General

Unless otherwise specified, inspection at the source of production for such materials and fabricated items as bituminous paving mixtures, structural concrete, fabricated metal products, cast metal products, welding, reinforced and unreinforced concrete pipe, application of protective coatings, and similar shop and plant operations is not required. A certificate of compliance, signed by an authorized officer of the producer, certifying compliance with the contract documents will be submitted for all of the following materials: steel pipe, sizes less than 18 inches; vitrified clay pipe; asbestos cement pipe; cast iron pipe; reinforced concrete pipe; non-reinforced concrete pipe; and PVC sewer and water pipe; subject to sampling and testing by City.

Standard items of equipment, such as electric motors, conveyors, plumbing fittings and fixtures, lumber, plywood, and so on, are subject to inspection at the job site.

All other equipment items will be inspected and tested in accordance with the contract documents.

The City does not provide full time inspection. The Contractor will provide 24-hour minimum notice for each inspection required by the work unless other arrangements have been agreed upon, in writing, with the City Engineer. Any inspection required outside of normal working hours and days, including holidays, will be at the Contractor's cost at rates established by the City.

4-6 TRADE NAMES

Delete Subsection 4-6 and replace with the following:

4-6.1 Trade Names or Equals

Whenever any material, product, equipment, or service is specified by brand, trade, or proprietary name, the item so specified will be deemed to be followed by the words “or equal”.

For the City's consideration of a proposed "equal" item, the Bidder must submit, a minimum of ten (10) calendar days before the date of the bid opening, documentation of the particulars of the proposed "equal item". At a minimum, the submitted documentation will include:

- Written request with explanation of why the product should be considered as an equal product.
- Material specifications.
- Technical specifications.
- Test data.
- Samples.
- Comparison chart of key specifications of the "equal" item against similar specifications of the specified item.
- Work locations and reference telephone numbers of at least three (3) locations where the proposed "equal" item has been recently installed under similar conditions.
- Warranty data.

The Bidder will be notified by the Engineer whether or not the proposed "equal" product is acceptable to the City five (5) calendar days before the date of the bid opening. Failure to submit all required documentation and/or submittal of incomplete documents may result in the City's rejection of the proposed "equal" product without further consideration.

SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES

5-3 LABOR

Add the following subsections:

5-3.2 Prevailing Wages

The Contractor will post at appropriate conspicuous points at the site of the Project the prevailing wage determinations for the Project based on the Bid Dates from the Director of the Department of Industrial Relations (DIR) of the prevailing rate of per diem wages.

The Contractor shall obtain copies of the prevailing rate of per diem wages the California Department of Industrial Relations website which is currently located at www.dir.ca.gov, or by calling the Prevailing Wage Unit at (415) 703-4774.

5-3.5 Apprentices

Add the following to the Subsection:

Attention is directed to Labor Code §§ 1777.5, 1777.6 and 3098 concerning the employment of apprentices by the Contractor or any subcontractor.

Labor Code § 1777.5 requires the Contractor or subcontractor employing tradesmen in any apprenticeship occupation to apply to the joint apprenticeship committee nearest the site of the Public Works Project and which administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen that will be used in the performance of the contract. The ratio of apprentices to journeymen in such cases will not be less than one to five except:

a) When employment in the area of coverage by the joint apprenticeship committee has exceeded an average of 15 percent in the ninety (90) calendar days before the request for certificate, or

b) When the number of apprentices in training in the area exceeds a ratio of one to five, or

c) When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally, or

d) When the Contractor provides evidence that the Contractor employs registered apprentices on all of his contracts on an annual average of not less than one apprentice to eight journeymen.

The Contractor is required to make contributions to funds established for the

administration of apprenticeship programs if the Contractor employs registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the Public Works site are making such contributions.

The Contractor and any subcontractor will comply with Labor Code §§ 1777.5 and 1777.6 in the employment of apprentices.

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

5-3.3 Record of Wages Paid: Audit

Every Contractor and subcontractor will keep an accurate certified payroll records showing the name, occupation, and the actual per diem wages paid to each worker employed in connection with the Work. The record will be kept open during normal construction hours for audit or inspection by the City Department or Representative that awarded the contract and to the Division of Labor Law Enforcement. If requested by the City, the Contractor will provide copies of the records at its cost.

5-4 INSURANCE

Delete Subsection and insert the following:

5-4.1 General

Liability policies will contain, or be endorsed to contain the provisions specified in these Supplemental Provisions and the Standard Specifications.

Contractor must procure and maintain for the duration of the contract the following insurance coverages and limits against claims for injuries to persons or damage to property that may arise from or in connection with the performance of the work covered by this agreement by the Contractor, its agents, representatives, employees or subcontractors:

COVERAGE PER OCCURRENCE	**ISO FORM**	**COMBINED SINGLE LIMIT**
Comprehensive General Liability	CL 00 01 04 13	$2,000,000
Business Auto	CA 00 01 06 92	$1,000,000
Workers' Compensation		Statutory

Contractor will provide endorsements or other proof of coverage for contractual liability.

Each insurance policy required by this subsection will be endorsed to state that coverage will not be suspended, voided, cancelled by either party, reduced in coverage

or in limits except after thirty (30) calendar days written notice by certified mail, return receipt requested, has been given to:

CITY CLERK
City of El Segundo
350 Main Street
El Segundo, CA 90245

Notwithstanding the foregoing, the endorsement may state that insurance may be cancelled upon thirty (30) calendar day notification for non-payment of premium. The Contractor will provide the City with updated proof of insurance should the Contract Time extend beyond the policy expiration date.

All liability insurance will be on an occurrence basis. Insurance on a claims-made basis will be rejected. Any deductibles or self-insured retentions will be declared to and approved by City. The insurer will provide an endorsement to City eliminating such deductibles or self-insured retentions as respects the City, its officials, employees, agents, and volunteers.

Except for Workers Compensation Insurance, Contractor will furnish to City certificates of insurance and endorsements on forms acceptable to the City's City Attorney, duly authenticated, giving evidence of the insurance coverages required in this contract and other evidence of coverage or copies of policies as may be reasonably required by City from time to time. Endorsements must be supplied on ISO Form No. CG 20 10 11 85, or equivalent. Certificate/endorsement for Workers Compensation Insurance will be furnished on State Comp Fund or other industry standard form. Except for worker's compensation insurance, all insurance required herein will be placed with insurers with a Best's Rating of not less than A:VII. Worker's compensation insurance policies will meet the requirements of California law.

All subcontractors employed on the work referred to in this contract will meet the insurance requirements set forth for Contractor. Contractor will furnish certificates of insurance and endorsements for each subcontractor at least five days before the subcontractor entering the job site, or Contractor will furnish City an endorsement including all subcontractors as insureds under its policies.

Except as provided in Subsection 6-5, the Contractor will save, keep and hold harmless the City, its officers, officials, employees, agents and volunteers from all damages, costs or expenses in law or equity that may at any time arise or be claimed because of damages to property, or personal injury received by reason of or in the course of performing work, which may be caused by any willful or negligent act or omission by the Contractor or any of the Contractor's employees, or any subcontractor. The City will not be liable for any accident, loss or damage to the work before its completion and acceptance, except as provided in Subsection 6-5.

The cost of such insurance will be included in the various items of work in the

Contractor's bid and no additional compensation for purchasing insurance or additional coverage needed to meet these requirements will be allowed.

In the event that any required insurance is reduced in coverage, cancelled for any reason, voided or suspended, Contractor agrees that City may arrange for insurance coverage as specified, and Contractor further agrees that administrative and premium costs may be deducted from payments due to the Contractor. Contractor **will not** be allowed to work until alternate coverage is arranged.

Coverage will not extend to any indemnity coverage for the active negligence of the additional insured if the agreement to indemnify the additional insured would be invalid under Civil Code § 2782(b).

Combined single limit per occurrence will include coverage for bodily injury, personal injury, and property damage for each accident.

If Commercial General Liability Insurance or other form with a general aggregate limit is used, the policy will be endorsed such that the general aggregate limit will apply separately to this contract and a copy of the endorsement provided to the City.

5-4.2 General Liability

The Contractor's insurance coverage will be primary insurance as respects to the City, its officers, officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, agents, and volunteers will be in excess of the Contractor's insurance and will not contribute with to the Contractor's Combined Single Limit.

The City, its officers, officials, employees, agents, and volunteers will be covered as insureds as to any respect of any liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor. The coverage will contain no special limitations on the scope or protection afforded to the City, its officers, officials, employees, agents, or volunteers.

The insurer will agree in writing to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by the Contractor for the City.

Any failure to comply with reporting provisions of the policies will not affect coverage provided to the City, its officers, officials, employees, agents and volunteers.

The Contractor's insurance will apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

5-4.3 Worker's Compensation

The insurer will agree to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by the Contractor for the City.

5-4.4 Auto Liability Insurance

The City, its officers, officials, employees, agents, and volunteers will be covered as insureds as to any respect of any liability arising out of activities performed by or on behalf of the Contractor in automobiles owned, leased, hired or borrowed. The coverage will contain no special limitations on the scope or protection afforded to the City, its officers, officials, employees, agents, or volunteers.

The insurer will agree in writing to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by the Contractor for the City.

Any failure to comply with reporting provisions of the policies will not affect coverage provided to the City, its officers, officials, employees, agents and volunteers.

The Contractor's insurance will apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

The insurer will agree to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses arising from work performed by the Contractor for the City.

5-4.5 Indemnification and Defense

In addition to the provisions of Subsection 5-4 of the Greenbook as between the City and Contractor. The Contractor will take and assume all responsibility for the Work as stated herein or shown on the plans.

The Contractor will bear all losses and damages directly or indirectly resulting to the Work. The Contractor shall hold harmless the City, its officers, employees, and agents, or to others on account of the performance or character of the work, unforeseen difficulties, accidents, traffic control, job site maintenance, or any other causes whatsoever.

The Contractor will assume the defense of and indemnify and save harmless the City of El Segundo, its officers, employees, and agents, from and against any and all claims, losses, damage, expenses and liability of every kind, nature, and description, directly or indirectly arising from the performance of the contract or work, regardless of responsibility for negligence, and from any and all claims, losses, damage, expenses,

and liability, howsoever the same may be caused, resulting directly, or indirectly from the nature of the work covered by the contract, regardless of responsibility for negligence, to the fullest extent permitted by law. In accordance with Civil Code § 2782, nothing in this Subsection 5-4.2 or in Subsection 5-4 of the Standard Specifications will require defense or indemnification for death, bodily injury, injury to property, or any other loss, damage or expense arising from the sole negligence or willful misconduct of the City, or its agents, servants or independent contractors who are directly responsible to the City, or for defects in design furnished by such persons. Moreover, nothing in this Subsection 5-4.2 or in Subsection 5-4 will apply to impose on the Contractor, or to relieve the City from, liability for active negligence of the City.

The City does not, and will not, waive any rights against the Contractor which it may have by reason of the aforesaid hold harmless agreements because of the acceptance by the City, or deposit with City by Contractor, of any insurance policies described in Subsection 5-4 of the Special Provisions. This hold harmless agreement by the Contractor will apply to all damages and claims for damages of every kind suffered, or alleged to have been suffered by reasons of any of the aforesaid operations of Contractor, or any subcontractor, regardless of whether or not such insurance policies are determined to be applicable to any of such damages or claims for damages.

No act by the City, or its representatives in processing or accepting any plans, in releasing any bond, in inspecting or accepting any work, or of any other nature, will in any respect relieve the Contractor or anyone else from any legal responsibility, obligation or liability he might otherwise have.

5.7 SAFETY

5-7.4 Hazardous Material

Insert the following Subsection:
For any excavation, which extends more than four feet below existing grade, the Contractor will promptly, and before the conditions are disturbed, notify the Engineer, in writing, of:

1) any material that the Contractor believes may be hazardous waste, as defined in Health and Safety Code § 25117, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
2) subsurface or latent physical conditions at the site differing from those indicated.
3) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

After receiving notice from the Contractor, the Engineer will promptly investigate any condition identified by the Contractor as being hazardous. The rights and obligations

of the City and the Contractor with regard to such conditions (including, without limitation, the procedures for procuring change orders and filing claims) will be specified by the provisions of Subsection 2-9 (Changed Conditions) of the Greenbook.

If a dispute arises between the City and the Contractor whether the conditions materially differ, involve hazardous waste, or cause a change in the Contractor's cost or time required for performance of the work, the Contractor will not be excused from any scheduled completion date provided for by the contract, but will proceed with all work to be performed under the contract. The Contractor will retain all rights provided by Subsection 2-10, Disputed Work, of the Greenbook.

If the Engineer determines that material called to the Engineer's attention by the Contractor is hazardous waste, or if the Engineer otherwise discovers the existence of hazardous waste, the Contractor will be responsible for removal and disposal of the hazardous waste by qualified personnel and appropriate equipment in the manner required by law as directed by the Engineer, subject to the provisions of Section 2 (Scope of Work) of the Greenbook.

SECTION 6 - PROSECUTION AND PROGRESS OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK

Delete Section 6-1, and replace with the following:.

Pre-Construction Meeting:

After contract award, the City will arrange for a pre-construction meeting to discuss the construction of the Project. The City will invite utility agencies and the contractor will arrange for all of its subcontractors to attend the meeting.

6-1.1 Contract Schedule

After notification of award and before starting any work, the Contractor will submit a Contract Schedule to the Engineer for review, as required by these Specifications within fifteen (15) calendar days of award.

6-1.2 Content of the Contract Schedule

The Contract Schedule, and any Contract Schedule updates, shall meet the following requirements:

1. Schedules must be suitable for monitoring progress of the Work.
2. Schedules must provide necessary data about the time for the Engineer’s decisions.
3. Schedules must be sufficiently detailed to demonstrate adequate planning for the Work.

4. Schedules must represent a practical plan to complete the Work within the Contract Time.
5. Schedules must show the critical path method for completing the Work.

The Engineer's review of the form and general content of the Contract Schedule and any Contract Schedule updates are only for the purpose of determining if the listed requirements are satisfied, nothing more.

6-1.3 Effect of Contract Schedule

The Contract Schedule, and any Contract Schedule updates, will represent a practical plan to complete the Work within the Contract Time. Extension of any schedule beyond the Contract Time will not be acceptable. Schedules showing the Work completed in less than the Contract may be acceptable if judged by the Engineer to be practical. Acceptance of such a schedule by the Engineer will not change the Contract Time. The Contract Time, not the Contract Schedule, will control in determining liquidated damages payable by the Contractor and in determining any delay.

If a schedule showing the Work completed in less than the Contract Time is accepted, the Contractor will not be entitled to extensions of the Contract Time for Excusable Delays or Compensable Delays or to adjustments of the Contract Sum for Compensable Delays until such delays extend the completion of the Work beyond the expiration of the Contract Time.

The Contractor will plan, develop, supervise, control, and coordinate the performance of the Work so that its progress and the sequence and timing of Work activities conform to the current accepted Contract Schedule. The Contractor will continuously obtain from Subcontractors information and data about the planning for and progress of the Work and the delivery of equipment, will coordinate and integrate such information and data into Contract Schedule updates and will monitor the progress of the Work and the delivery of equipment. The Contractor will act as the expeditor of potential and actual delays, interruptions, hindrances, or disruptions for its own forces and those forces of Subcontractors. The Contractor will cooperate with the Engineer in developing the Contract Schedule and updated Contract Schedules.

The Engineer's review and comments about any schedule or scheduling data will not relieve the Contractor from its sole responsibility to plan for, perform, and complete the Work within the Contract Time. Review and comments about any schedule will not transfer responsibility for any schedule to the Engineer or the City nor imply their agreement with (1) any assumption upon which such schedule is based or (2) any matter underlying or contained in such schedule.

The Engineer's failure to discover errors or omissions in schedules that have been reviewed, or to inform the Contractor that the Contractor, Subcontractors, or others are behind schedule, or to direct or enforce procedures for complying with the Contract Schedule will not relieve the Contractor from its sole responsibility to perform and

complete the Work within the Contract Time and will not be a cause for an adjustment of the Contract Time or the Contract Sum.

The Contractor will perform the Work in accordance with the currently accepted Contract Schedule.

6-1.4 Commencement of Contract Time

The Contract Time will commence when the City issues a Notice to Proceed. The Work will start on the date specified in the Notice to Proceed and within a maximum of fifteen (15) calendar days after the date of the Notice to Proceed, and be diligently prosecuted to completion with the time provided in the Specifications.

6-3.3 Working Days and Working Hours

City Hall is open from Monday thru Thursday 7am -5pm and Friday's 7am-4pm. It is closed the following holidays:

New Year's Day
Martin Luther King, Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving
Christmas Eve
Christmas
New Year's Eve
New Year's Day

Working on Fridays when City Hall is closed is acceptable. If the Contractor, however, requests an inspection a day when City Hall is closed, then the Contractor will have to reimburse the City for the costs of inspection. The Contractor must request such an inspection at least 48 hours in advance. City inspections during hours when City Hall is closed are subject to inspection overtime fees to be paid for by the Contractor. Friday work that does not require inspection can be done without an inspection fee and must be discussed with City staff before its occurrence. If the Contractor does construction on a Friday or a day when City Hall is closed, that day is counted as a project working day.

On workdays, Contractor's activities will be confined to the hours between 7:00 a.m. and 4:00 p.m. Please see Section 6-3.5 below for weekend and holiday work restrictions.

6-3.4 Night Work

Add the following paragraph:

The City will not permit Work between the hours of 4 p.m. and 7 a.m. of the following day unless specifically provided for in the bid documents or unless the Contractor receives prior written approval.

6-3.5 Weekend and Holiday Work

The Engineer may, but is not required to, allow the Contractor to work on Saturdays, Sundays and City Holidays.

6-4 DELAYS AND EXTENSIONS OF TIME

Delete and replace with the following:

6-4.1 General

If delays are caused by unforeseen events beyond the control of the Contractor, such delays will entitle the Contractor to an extension of time as provided herein, but the Contractor will not be entitled to damages or additional payment due to such delays except as otherwise provided herein. Excusable delay may include: war, earthquakes exceeding 3.5 on the Richter Scale, government regulation, labor disputes outside the contemplation of the parties, strikes outside the contemplation of the parties, fires, floods, changes to the Work as identified herein, or other specific events that may be further described in the Specifications.

Delays to the Project caused by labor disputes or strikes involving trades not directly related to the Project, or involving trades not affecting the Project as a whole will not warrant an extension of time.

The City will not grant an extension of time for a delay by the Contractor's inability to obtain materials unless the Contractor furnishes to the Engineer documentary proof. The proof must be provided in a timely manner in accordance with the sequence of the Contractor's operations and accepted construction schedule.

Should delays be caused by events other than those included herein, the Engineer may, but is not required to, deem an extension of time to be in the City's best interests.

6-4.2 Extensions of Time

If granted, extensions of time will be based upon the effect of delays to the critical path of the Work as determined by the current accepted Contract Schedule. Delays to minor portions of the Work that do not affect the critical path will not be eligible for

extensions of time.

6-4.3 Payment for Delays to Contractor

Any payment for compensable delay will be based upon actual costs as set forth in Subsection 402-5.1 excluding, without limitation, what damages, if any, the Contractor may have reasonably avoided. The Contractor understands that this is the sole basis for recovering delay damages and explicitly waives any right to calculate daily damages for office overhead, profit, or other purported loss, using different formulas including, without limitation, the Eichleay Formula.

6-4.4 Written Notice and Report

If the Contractor desires payment for a delay or an extension of time, it will give the Engineer written notice of such request not later than the time limit set forth in the Proposal for submitting a claim after the event or occurrence giving rise to a delay claim. Failure to submit a written request within such amount of time will result in the Contractor waiving its delay claim.

Any claim for payment or an extension of time must be in the form required by the "Claims" sections of these Specifications.

In no event will the City grant the Contractor an extension of time if the delay is within the Contract Time as identified by the Contract Documents.

6-7 DEFAULT BY CONTRACTOR

The language in subsection 6-7 is deleted in its entirety and replaced with the following subsections.

6-7.1 General

Should the Contractor fail to begin delivery of material and equipment, to commence the Work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fail to maintain the Work schedule (as determined by the current accepted Contract Schedule) which will ensure the City's interest, or if the Contractor is not carrying out the intent of the Contract, the City may serve written notice upon the Contractor and the Surety on its Faithful Performance Bond demanding satisfactory compliance with the Contract.

6-7.2 Termination of Contractor's Control Over the Work

The City may terminate the Contractor's control over the Work without liability for damages when, in the City's opinion, the Contractor is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the Work without the City's consent. Should such termination occur, the Contractor will be paid the actual

amount due based on Contract Unit Prices or lump sums bid and the quantity and quality of the Work completed at the time of termination, less damages caused to the City by the Contractor's action or inaction.

In the event of such termination of control, the City may do any one, or combination of, the following:

1. Serve written notice upon the Surety on its Faithful Performance Bond demanding satisfactory compliance with the Contract. In such event the Surety will, within 5 days, assume control and perform the Work as successor to the Contractor;
2. The City may perform the Work itself and deduct the cost thereof from any payment due to the Contractor;
3. The City may replace the Contractor with a different contractor to complete the work and deduct the cost thereof from any payment due to the Contractor.

Nothing herein will waive, or serve as a limitation upon, any additional remedy the City may have under these Contract Documents or applicable law.

6-7.3 Surety's Assumption of Control

Should the Surety assume any part of the Work, it will take the Contractor's place in all respects for that part, and will be paid by the City for all work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default will be payable to the Surety as the Work progresses, subject to the terms of the Contract.

If the Surety does not assume control and perform the Work within 5 days after receiving notice of cancellation, or fails to continue to comply, the City may exclude the Surety from the premises. The City may then take possession of all material and equipment and complete the Work by City's forces, by letting the unfinished work to another contractor, or by a combination of such methods. In any event, the cost of completing the Work will be charged against the Contractor and its Surety and may be deducted from any money due or becoming due from the City. If the sums due under the Contract are insufficient for completion, the Contractor or Surety will pay to the City within 5 days of completion, all costs in excess of the sums due.

The provisions of this subsection will be in addition to all other rights and remedies available to the City under applicable law.

6-9 LIQUIDATED DAMAGES

Delete and replace with the following:

6-9.1 Failure to Complete Work on Time

If all the work called for under the contract is not completed before or upon the expiration of the Contract Time, the City will sustain damage. Since it is and will be impracticable to determine the actual damage which the City will sustain in the event of and by reason of such delay, it is therefore agreed that the Contractor will pay to the City the sum specified in the Proposal for each and every calendar day beyond the time prescribed to complete the work not as a penalty, but as a predetermined liquidated damage. The Contractor agrees to pay such liquidated damages as are herein provided, and in case the same are not paid, agrees that the City may deduct the amount thereof from any money due or that may become due to the Contractor under the contract.

Unless otherwise specified, liquidated damages will be $250 per calendar day.

SECTION 7 – MEASUREMENT AND PAYMENT

7-2 LUMP SUM WORK

Subsection 7-2, Lump Sum Work, of the Greenbook is deleted in its entirety and replaced by the following:

Items for which quantities are indicated as "Lump Sum," "L.S.," or "Job" will be paid for at the price indicated in the Proposal. Such payment will be full compensation for all costs for labor, equipment, materials and plant necessary to furnish, construct and install the lump sum item of work, complete, in place, and for all necessary appurtenant work, including, but not limited to, all necessary cutting, patching, repair and modification of existing facilities, and clean up of site.

Contractor will furnish three copies of a detailed schedule, which breaks down the lump sum work into its component parts and cost for each part, in a form and sufficiently detailed as to satisfy Engineer that it correctly represents a reasonable apportionment of the lump sum. This schedule is subject to approval by Engineer as to both the components into which the lump sum item is broken down, and the proportion of cost attributable to each component.

This schedule will be the basis for progress payments for the lump sum work.

7.3 PAYMENT

7-3.2 Partial and Final Payments

Delete and replace with the following:

The closure date for the purpose of making partial progress payments will be the *last working day of each month*. The Contractor will prepare the partial payment invoice with measurement of the work performed through the closure date and submit it to the CITY for approval.

When work is complete, the Contractor will determine the final quantities of the work performed and prepare the final progress payment, and submit it to the Engineer for approval.

It will take a minimum of thirty-five (35) calendar days from the date of approving the Contractor's invoice to make the payment to the Contractor. However, payments will be withheld pending receipt of any outstanding reports required by the contract documents, or legal release of filed Stop Payment Notices against the Contractor. In addition, the final progress payment will not be released until the Contractor returns the control set of Plans and Specifications showing the as-built conditions.

The full five percent (5%) retention will be deducted from all progress payments. The Contractor will make a payment request for the retained amount, for approval by the City, upon field acceptance of the work by the City Engineer. The City Engineer upon field acceptance and receipt of the final as-built plans and any other reports or documents required to be provided by the Contractor will process a recommendation to the City Council for acceptance of the work. Not less than thirty-five (35) calendar days from the City Council acceptance of the work, the Contractor's final payment will be made provided Stop Payment Notices or other claims have not been filed against the Contractor and/or the City by material suppliers, subcontractor, other governmental agencies, and private property owners. Until these Stop Payment Notices are released and claims are resolved the stop payment/claim amount will be withheld from the final payment.

The Contractor, however, may receive interest on the retention for the length of construction, or receive the retention itself as long as the retention is substituted with escrow holder surety or equal value.

At the request and expense of the Contractor, surety equivalent to the retention may be deposited with the State Treasurer, or a State or Federally chartered bank, as the escrow agent, who will pay such surety to the Contractor upon satisfactory completion of the contract.

Pursuant to PCC § 22300, the Contractor may substitute securities for retention monies held by the City or request that the City place such monies into an escrow account. The Contractor is notified, pursuant to PCC § 22300, that any such election will be at the Contractor's own expense and will include costs incurred by the City to accommodate the Contractor's request.

Progress payment paid by the City as contemplated herein, will be contingent upon the Contractor submitting, in addition to any additional documents, an updated Contract Schedule in the form prescribed by these Contract Documents. Failure of the Contractor to submit an acceptable updated Contract Schedule will result in the City withholding partial payment, without liability to the City, until such an acceptable updated Contract Schedule is submitted. Nothing herein will allow the Contractor to suspend or slow progress of the Work.

A City Council resolution established a Project Payment Account, encumbered money in the current budget, and assigned that money to the Project Payment Account which is the sole source of funds available for payment of the Contract Sum. Contractor understands and agrees that Contractor will be paid only from this special fund and if for any reason this fund is not sufficient to pay Contractor, Contractor will not be entitled to payment. The availability of money in this fund, and City's ability to draw from this fund, are conditions precedent to City's obligation to make payments to Contractor.

7-3.2.1 Final Payment and Termination of Agency Liability

Before receiving final payment, the Contractor will execute a "Release on Contract" form which will operate as, and will be a release to the City, the City Council, and each member of the City Council and their agencies, from all claims and liability to the Contractor for anything done or furnished for, or relating to, the work or for any act of neglect of the City of any person relating to or affecting the work, except the claim against the City for the remainder, if any there be, of the amounts kept or retained as provided in Subsections 9-3 of the Standard Specifications and except for any unsettled claims listed on said form which have been filed in compliance with the requirements for making claims.

7-3.3 Delivered Materials

Materials and equipment delivered or stored, but not incorporated into the work, will not be approved for progress payments.

7.4 PAYMENT FOR EXTRA WORK

7-4.2 Basis for Establishing Costs

7-4.2.3 Tools and Equipment Rental

Delete the second and third paragraphs and replace with "Regardless of ownership, the rates to be used in determining the equipment usage costs will not exceed those listed for the same or similar equipment in the California State Department of Transportation publication of Labor Surcharge and Equipment Rates effective for the period of usage."

7-4.3 Markup

Delete and replace with the following:

7-4.3.1 Work by Contractor

The following percentages will be added to the Contractor's costs and will constitute the markup for all overhead and profits.

1) Labor.....20
2) Materials.....15
3) Equipment Rental 15
4) Other Items and Expenditures.....15

To the sum of the costs and markups provided for in this subsection, 1 percent will be added as compensation for bonding. No other formula, e.g., the Eichleay or other method, may be used to calculate daily damages for office overhead, profit, or other purported loss.

7-4.3.2 Work by Subcontractors

When all or any part of the extra work is performed by a Subcontractor, the markup established in 7-4.3(a) will be applied to the Subcontractor's actual cost of such work. A markup of 10 percent on the first $5,000 of the subcontracted portion of the extra work and a markup of 5 percent on work added in excess of $5,000 of the subcontracted portion of the extra work may be added by the Contractor.

7-4.3.3 Compensable Delays

In the event that City becomes liable to Contractor for compensable delays, City agrees to pay Contractor the daily Contractor Delay Damages set forth in the Bid Form or Contractor's actual daily delay damages, whichever is less, for each day of Compensable Delay as provided for by these Contract Documents.

7-4.4 Daily Reports by Contractor

Insert the following paragraph at the end of the subsection :

If disagreement continues regarding extra work, the Contractor may seek compensation in accordance with the Claims procedure. Daily Reports required by this subsection must be made part of the Claim as supporting data for the Claim.

7-4.5 Disputes and Claims Procedure

7-4.5.1 General

Consistent with PCC § 10240.6, "Claim" means a written demand or assertion by the Contractor that seeks an adjustment or interpretation of the terms of the Contract Documents, payment of money, extension of time, or other relief with respect to the Contract Documents, including a determination of disputes or matters in question between the City and the Contractor arising out of or related to the Contract Documents or the performance of the Work, and claims alleging an unforeseen condition or an act, error, or omission by the City, the Engineer, their agents or employees. "Claim" does not mean, and the Claims procedures herein do not apply, to the following:

1. Claims respecting penalties for forfeitures prescribed by statute or regulations, which a government agency is specifically authorized to administer, settle, or determine.
2. Claims respecting personal injury, death, reimbursement, or other compensation arising out of or resulting from liability for personal injury or death.
3. Claims respecting a latent defect, breach of warranty, or guarantee to repair.
4. Claims respecting stop notices.

If a Claim is subject to the Change Order procedures, the Claim arises upon the issuance of a written final decision denying in whole or in part the Contractor's Change Order Request. If a Claim is not subject to the Change Order Procedures, the Claim arises when the Contractor discovers, or reasonably should discover, the condition or event giving rise to the Claim.

7-4.5.2 Form and Content

A Claim must include the following:

1. A statement that it is a Claim and a request for a decision.

2. A detailed description of the act, error, omission, unforeseen condition, event or other condition giving rise to the Claim.

3. If the Claim is subject to the Change Order procedures, a statement demonstrating that a Change Order Request was timely submitted and denied.

4. A detailed justification for any remedy or relief sought by the Claim, including to the extent applicable, the following:

    a) If the Claim involves extra work, a detailed cost breakdown claimed. The breakdown must be provided even if the costs claimed have not been incurred when the Claim is submitted.

    b) To the extent costs have been incurred when the Claim is submitted, the Claim must include actual cost records (including, without limitation, payroll records, material and rental invoices) demonstrating that costs claimed have actually been incurred.

    c) To the extent costs have not yet been incurred at the time the Claim is submitted, actual cost records must be submitted on a current basis not less than once a week during any periods costs are incurred. A cost record will be considered current if submitted within seven (7) calendar days of the date the cost reflected in the record is incurred. At the Engineer's request, claimed extra costs may be subject to further

verification procedures (such as having an inspector verify the performance of alleged extra work on a daily basis).

5. If the Claim involves an error or omission in the Contract Documents:

   a) An affirmative representation that the error or omission was not discovered before submitting a bid for the Contract; and

   b) A detailed statement demonstrating that the error or omission reasonably should not have been discovered by the Contractor, its Subcontractors and suppliers, before submitting a bid for the Contract.

6. If the Claim involves an extension of the Contract Time, written documentation demonstrating the Contractor's entitlement to a time extension.

7. If the Claim involves an adjustment of the Contract Sum for delay, written documentation demonstrating the Contractor's entitlement to such an adjustment.

8. A personal certification from the Contractor that reads as follows:

   "I, _____, BEING THE _____ (MUST BE AN OFFICER) OF _____ (CONTRACTOR NAME), DECLARE UNDER PENALTY OF PERJURY UNDER CALIFORNIA LAW, AND DO PERSONALLY CERTIFY AND ATTEST THAT I HAVE THOROUGHLY REVIEWED THE ATTACHED CLAIM FOR ADDITIONAL COMPENSATION OR EXTENSION OF TIME, AND KNOW ITS CONTENTS, AND SAID CLAIM IS MADE IN GOOD FAITH; THE SUPPORTING DATA IS TRUTHFUL AND ACCURATE; THAT THE AMOUNT REQUESTED ACCURATELY REFLECTS THE CONTRACT ADJUSTMENT FOR WHICH THE CONTRACTOR BELIEVES CITY IS LIABLE; AND, FURTHER, THAT I AM FAMILIAR WITH CALIFORNIA PENAL CODE § 72 AND CALIFORNIA GOVERNMENT CODE § 12650, ET SEQ., PERTAINING TO FALSE CLAIMS, AND FURTHER KNOW AND UNDERSTAND THAT SUBMITTING OR CERTIFYING A FALSE CLAIM MAY LEAD TO FINES, IMPRISONMENT, AND OTHER SEVERE LEGAL CONSEQUENCES."

7-4.5.3 Claims Submitted to the Engineer

Within thirty (30) calendar days after the circumstances giving rise to a Claim occur, the Contractor will submit its Claim to the Engineer for a decision. Regardless of any Claim submittal, or any dispute regarding a Claim, unless otherwise directed by the Engineer, the Contractor will not cause any delay, cessation, or termination of the Work, but will diligently proceed with the performing the Work in accordance with the Contract Documents. Except as otherwise provided, the City will continue to make

payments in accordance with the Contract Documents.

7-4.5.4 Claim is Prerequisite to Other Remedy

The Contractor certifies that it is familiar with PCC § 10240.2 and understands and agrees that submitting a Claim in accordance with these Specifications is an express condition precedent to the Contractor's right to otherwise pursue a claim whether through alternative dispute resolution or by litigation. Should the Contractor fail to submit a claim in accordance with these Specifications, including the time limits set forth herein, it will waive any right to a remedy, whether in law or equity, it might otherwise have pursuant to the Contract Documents or applicable law.

7-4.5.5 Decision on Claims

The Engineer will promptly review Claims submitted by the Contractor in accordance with these Specifications. Should the Engineer require additional supporting evidence to evaluate the claim, the Engineer will request such additional information in writing. Any such requested data will be furnished not later than ten (10) calendar days after the Contractor receives the Engineer's request.

The Engineer will render a decision not later than thirty (30) days after either receiving the Claim or the deadline for furnishing additional supporting data, whichever is later. If the Claim amount is more than $50,000, the time period will be extended to sixty (60) days. If the Engineer fails to render a decision within the time period established herein, then the Claim will be deemed denied. The Engineer's decision will be final and binding unless appealed in accordance with these Specifications.

The Engineer's decision on a Claim will include a statement substantially as follows:

"This is a decision pursuant to the General Specifications of your contract. If you are dissatisfied with the decision, and have complied with the procedural requirements for asserting claims, you may have the right to alternative dispute resolution or litigation. Should you fail to take appropriate action within thirty (30) calendar days of the date of this decision, the decision will become final and binding and not subject to further appeal."

7-4.5.6 Appeal of Engineer's Decision

Should the Contractor dispute the Engineer's decision, then the Contractor must appeal that decision to the City's Public Works Director within thirty (30) calendar days of receiving the Engineer's decision.

The Public Works Director will address disputes or claims within thirty (30) calendar days after receiving such request and all necessary supporting data. The Public Works Director's decision on the dispute or claim will be the City's final decision.

If the Contractor disputes the Public Works Director's decision, then the Contractor must demand alternative dispute resolution in accordance with this Section and the PCC within thirty (30) calendar days of the City's final decision.

7-4.5.7 Mediation

If the City and the Contractor agree, disputes between the parties may be submitted to non-binding mediation. If the parties cannot agree to an alternative form of mediation, then mediation will be administered by the American Arbitration Association ("AAA") under its Construction Industry Mediation Rules, unless the use of such rules are waived by mutual stipulation of both parties.

The parties may, but are not required to be, represented by counsel in mediation.

The requirement for mediation will not alter or modify the time limitations otherwise provided for claims and no conduct or settlement negotiation during mediation will be considered a waiver of the City's right to assert that claim procedures were not followed.

7-4.5.8 Arbitration

If the City and Contractor do not agree to mediation, then a disputes will be submitted to neutral non-binding (except as provided herein) arbitration. Arbitration will be conducted in accordance with PCC § 10240.3. Any decision rendered by an arbitrator will be consistent with PCC § 10240.8.

The exclusive venue for any arbitration will be in Los Angeles County.

The expenses and fees of the arbitrators and the administrative fees, if any, will be divided among the parties equally. Each party will pay its own counsel fees, witness fees, and other expenses incurred for its own benefit.

7-4.5.9 When Arbitration Decision Becomes Binding

The decision rendered by the arbitrator will become binding upon the parties unless appealed to the Los Angeles County Superior Court pursuant to PCC § 10240.12 within thirty (30) calendar days of the decision. If subsequent litigation results in an award to the party appealing the arbitration that is less than or equal to that of the arbitration decision, or if the litigation results in a decision in favor of the nonappealing party, then the party appealing the arbitration will pay the nonappealing party's attorney's fees and court costs.

7-4.5.10 Appeal to Superior Court – Waiver of Jury Trial

Should a party timely object to the arbitration decision, it may file a petition with the Los Angeles County Superior Court in accordance with California Code of Civil

Procedure ("CCP") §§ 1285, et seq. Notwithstanding the limitations set forth in CCP § 1286.2, the court may vacate, correct, or adjust an arbitration award, and enter judgment in accordance with CCP § 1287.4, for any legal or equitable basis including, without limitation, error of law. The court will apply the substantial evidence standard of review when considering the appeal of an objecting party.

BY EXECUTING THESE CONTRACT DOCUMENTS, THE CONTRACTOR AGREES TO HAVE DISPUTES OR CONTROVERSY CONCERNING THE CONSTRUCTION, INTERPRETATION, PERFORMANCE, OR BREACH OF THESE CONTRACT DOCUMENTS, INCLUDING CLAIMS FOR BREACH OF CONTRACT OR ISSUES OF BAD FAITH DECIDED IN ACCORDANCE WITH THIS SECTION 6-11. BOTH THE CITY AND THE CONTRACTOR WAIVE THEIR RIGHT TO A JURY TRIAL FOR THESE DISPUTES OR ISSUES.

7-4.5.11 AB 626 Claims Process

Claims made by a Contractor for one or more of the following are subject to the claim resolution process set forth in Public Contract Code section 9204:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by the City under a contract for a Public Works Project.

(B) Payment by the City of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a Public Works Project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

(C) Payment of an amount that is disputed by the City.

PART 4 – EXISTING IMPROVEMENTS

SECTION 402 UTILITIES

402-2 PROTECTION

The following subsection is added to Subsection 402-2 of the Greenbook.

402-2.1 Incorrect Location of Utilities

If the Contractor, while performing the Work, discovers utility facilities not identified correctly or not shown in the contract plans or specifications by the City, the Contractor will immediately notify the City and utility owner in writing.

402-4 RELOCATION

The following subsection is added to Subsection 402-4 of the Greenbook.

402-4.1 Responsibility of Utility Removal or Relocation

The City will be responsible to arrange for the removal, repair, or relocation of existing utilities located within the Project limits if such utilities are not correctly identified in the contract plans or specifications by the City. The City will have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation.

402-5 DELAYS

Insert the following:

Actual loss, as used in this Subsection, will be understood to include no items of expense other than idle time of equipment and necessary payments for idle time of workers, cost of extra moving of equipment, and cost of longer hauls. Compensation for idle time of equipment and idle time of workers will be determined by Subsection 402-5.1 and no markup will be added in either case for overhead and profit. The cost of extra moving of equipment and the cost of longer hauls will be paid for as extra work.

402-5.1 Calculating Idle Time

Equipment idle time will calculated in accordance with Subsection 7-4.2.3 and based upon the actual normal working time during which the delay condition exists, but in no case will exceed 8 hours in any one day. The days for which compensation will be paid will be the calendar days, excluding Saturdays, Sundays and legal holidays, during the

existence of the delay.

Worker idle time will be calculated in accordance with Subsection 7-4.2.3.

- END OF SECTION -

SECTION III – SPECIAL PROVISIONS

1-0. GENERAL SCOPE, TIME FOR COMPLETION, AND LOCATION OF WORK

1-1. General Scope of Work:

The work to be done consists of furnishing all materials, tools, equipment, labor, supervision, incidentals, and related work for renovation improvements as required in the specifications, plans, and contract documents for the following project: "Emergency Operation Center Improvements".

1-2. Location of the Work:

The project will occur at the City's Emergency Operations Center located within the Police Department at 348 Main St, El Segundo, CA 90245.

1-3. Working Days and Time for Completion:

Contractor will commence work on date specified in the Notice to Proceed to be issued to the Contractor by City of El Segundo Public Works Department and shall complete work within **Fifty (50)** working days after the date of commencement.

2-0. NOTIFICATIONS

The CONTRACTOR will notify all agencies listed here in a minimum of forty-eight (48) hours before start of operation. The following list of names and telephone numbers are intended for the convenience of the CONTRACTOR and the City does not guarantee either the completeness or correctness of this list.

OPERATION	**OFFICE**	**TELEPHONE**
1. Start of work, shutdown of work, or resumption of work after shutdown	James Rice, Project Manager Cheryl Ebert, City Engineer Elias Sassoon, Director of Public Works	310-524-2316 310-524-2321 310-524-2356
2. Closing of streets	El Segundo Police Department** El Segundo Fire Department**	310-524-2200 310-524-2236

** The **CONTRACTOR** will notify the Engineering Division before notifying these offices.

The following information is provided for **CONTRACTOR'S** use to notify agencies if their facilities are affected by **CONTRACTOR'S** work:

1. Underground Service Alert (all excavation in public right-of-way) 800-227-2600

2.	City of El Segundo – Water Division	310-524-2742
3.	City of El Segundo - Wastewater Division	310-524-2754
4.	City of El Segundo - Recreation and Parks	310-524-2707
5.	Southern California Gas Company	310-671-9002
6.	Southern California Edison Company (SCE)	310-417-3366
7.	AT&T	310-515-4430
8.	Spectrum (Cable)	310-768-0400 Extension 414
9.	Los Angeles County Sanitation District	310-699-7411
10.	El Segundo Unified School District	310-615-2650

2-1. NO PARKING NOTIFICATIONS

The CONTRACTOR shall post City-approved temporary NO PARKING notices a minimum of seventy-two (72) hours before the start of operation. The CONTRACTOR shall promptly notify City staff once posting is completed in order to ensure the 72-hour requirement has been met.

The dates and times on the signs shall be site specific and shall cover the minimum time required for "NO PARKING" to facilitate construction. Generic long-term "NO PARKING" time designations are not acceptable. Parking shall not be restricted during any period when construction activity is not scheduled at this particular site.

3-0. MOBILIZATION

Mobilization shall conform to the provisions of Section 7-3.4 of the Standard Specifications. The scope of work under mobilization includes but is not limited to:

1. Obtaining and paying for all required bonds, insurance, permits, and licenses.
2. Completing and submitting required documents as required per specifications.
3. Moving on to the site of all Contractor's equipment required for operations.
4. Installing and removing of all temporary facilities required for operations.
5. Posting all OSHA required notices.
6. Submittal of Construction Schedule, Contractor Contact List, and Notices to City staff for City approval
7. Notification of City staff, residents, businesses and motorists, including temporary warning and safety signage where construction is or will be occurring. Notification shall be furnished by Contractor and shall be distributed seventy-two (72) hours prior to work in that area.
8. Re-notification of all affected parties for all construction schedule changes
9. Protection of utility facilities, landscapes, pavements, structures, and any existing condition and other public property in place during any construction activities. This includes protection of planter boxes and vegetation.

10. Restoration, to existing standard conditions or better, of public property damaged during construction
11. NPDES permit compliance
12. Bringing unforeseen field conditions to City staff's attention in a timely manner
13. Removal and disposal of any existing unused materials from the project sites.
14. Demobilization

3-1. Clearing, grubbing, and landscape removal shall take place as necessary for all construction activities to occur, including but not limited to Section 300-1 of the Standard Specifications. If applicable, live tree roots shall be inspected by the Recreation and Parks Division after the surface above them has been removed, to ascertain if tree root barrier installation or full tree removal is necessary. Costs for clearing, grubbing, and landscape/tree root removal shall be included in the bid prices for the different bid items. All such removals shall take place prior to any excavation for construction. Where necessary, the contractor shall replace residential landscaping or sprinklers damaged by construction after construction is complete.

3-2. Underground Service Alert, 1-800-227-2600, shall be contacted and the contractor shall determine the exact location of all utilities prior to beginning excavation and construction. If conflicts are discovered, the Contractor shall notify the Engineer immediately.

3-3. Demobilization shall include all activities for the Contractor to remove all equipment, on-site sanitary facilities, etc. from the project areas after construction is complete. Demobilization shall also include general cleanup activities and punch list items and specific activities determined by the City Public Works Inspector, to repair or replace any private or public facilities damaged by the construction and to return City property to the same or better condition as that existing prior to construction.

4-0. <u>CONSTRUCTION & DEMOLITION MATERIALS RECYCLING REQUIREMENTS</u>

The Contractor shall divert all Construction and Demolition (C&D) waste generated from the project in accordance with the California Green (CALGreen) Building Standards Code (pursuant to El Segundo Municipal Code, Title 13, Chapter 11). C&D waste can only be legally collected, removed, or transported by City of El Segundo permitted waste haulers. If the Contractor plans on collecting, removing, or transporting its own waste, approval from the City Engineer or designee is required.

Failure to meet the C&D waste recycling requirements will result in the assessment of penalties pursuant to El Segundo Municipal Code.

Contractor shall prepare a C&D Debris Management Plan as follows:

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following: procedures for ensuring optimal diversion of construction and demolition (C&D) waste materials generated by the Work within the limits of the Construction Schedule and Contract Sum.

1. The Integrated Solid Waste Management Act of 1989 ("AB 939"), requires that localities throughout the state develop source reduction, reuse, recycling, and composting programs to reduce the tonnage of solid waste disposed in landfills by 50%; this requirement may increase in the future. C&D waste materials generated by the Work are targeted to achieve these diversion rates.

2. A minimum of 50% by weight of the solid wastes generated in the Work shall be diverted from landfill disposal through a combination of reuse, recycling, and composting activities.

3. This section includes requirements for submittal of C&D Debris Management Plan prior to the commencement of the Work, and during the project, submittal of Contractor's quantitative reports for construction and demolition waste materials generated by the Contractor as a condition of approval of progress payments submitted to the Contracting Officer, and following completion of the project, as a condition of the release of final project retention.

1.2 DEFINITIONS

A. Class III Landfill. A landfill that accepts non-hazardous waste such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Department of Resources Recycling and Recovery (CalRecycle) and be regulated by the Enforcement Agency.

B. Construction and Demolition Debris or C&D Debris. Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt, concrete, Portland cement, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.

C. Contracting Officer. The City of El Segundo City Engineer or designee.

D. C&D Recycling Center. A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse or recycling, by weight.

E. Disposal. Final deposition of C&D or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such

stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.

F. Diversion or Divert. The reuse or recycling of construction and demolition debris to avoid disposal in a landfill.

G. Enforcement Agency (EA). Enforcement agency as defined in Public Resources Code 40130.

H. Inert Disposal Facility or Inert Waste Landfill. A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.

I. Inert Solids or Inert Waste. Non-liquid solid wastes including, but not limited to, soil and concrete that do not contain hazardous waste or soluble pollutants at concentrations in excess of water quality objectives established by a regional Water Board pursuant to Division 7 (Sections 13000 et seq) of the California Water Code and does not contain significant quantities of decomposable solid resources.

J. Mixed C&D Debris. Loads that include commingled recyclable and non-recyclable C&D debris generated at the construction site.

K. Mixed Debris Recycling Facility. A processing facility that accepts loads of solid waste and/or recycling materials for the purpose of recovering reusable, recyclable, and compostable materials and disposing the non-recyclable residual materials.

L. Recycling. The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

M. Reuse. The use of a material that might otherwise be discarded, in the same or similar form as it was produced.

N. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been “source separated.”

O. Solid Waste. Refer to Public Resources Code Section 40191.

P. Source-Separated. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or

reconstituted products which meet the quality standards necessary to be used in the marketplace.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SALVAGE, REUSE, RECYCLING AND PROCEDURES

A. Identify reuse, salvage, and recycling facilities: Refer to the City's website for a list of local organizations and companies.

https://www.elsegundo.org/government/departments/public-works/trash-recycling

B. Develop and implement procedures to reuse, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the C&D Debris Waste Management Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.

1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.

2. Explore the possibility of reusing project job-site inert materials, such as rock, concrete, dirt and aggregate, on-site for road base or other similar uses.

3. Source separate new construction, excavation and demolition materials including, but not limited to the following types:

   a. Asphalt

   b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.

   c. Red Clay Brick

   d. Soils

   e. Other materials, as appropriate, such as wood and corrugated cardboard.

4. Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source-separated to a mixed materials recycling facility.

5. Contractor may develop their own C&D Debris Management Plan based on CALGreen requirements or use available City forms as follows:

a. Form PW-A – Project Information

b. Form PW-B – Pre-Project Worksheet

c. Form PW-B1 – Pre-Project Worksheet (This form is to be completed only if you plan to use your own company-owned bins/trucks for disposition of material.)

d. Form PW-C – Post-Project Summary

e. Form PW-D – Exemption Request – only use if it is infeasible to comply with requirements.

3.2 DISPOSAL OPERATIONS AND WASTE HAULING

A. Legally transport and dispose of materials that cannot be delivered to a source-separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.

B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, visit the City of El Segundo website:

https://www.elsegundo.org/government/departments/public-works/trash-recycling

C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.

D. Legally transport and deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, or composting.

E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.3 REUSE AND DONATION OPTIONS

A. Implement a reuse program to the greatest extent feasible. Options for reuse may include, but are not limited to:

1. Los Angeles County Materials Exchange (LACOMax) LACoMAX is a free service provided by the Los Angeles County Department of Public Works, Environmental Programs Division, designed to help residents, businesses, and organizations in Los Angeles County find markets for their industrial by-products, surplus materials, and other would-be discards. All exchanges are coordinated between the parties. The site can be accessed at http://www.ladpw.org/epd/lacomax.

2. California Materials Exchange (CalMAX) is a free service provided by the State of California, Department of Resources Recycling and Recovery (CalRecycle) that connects businesses, organizations, manufacturers, schools, and individuals

with online resources for exchanging materials. The site can be accessed at www.calrecycle.ca.gov/CalMAX.

3. Habitat for Humanity ReStore resale outlets accept donated home improvement goods like furniture, home accessories, building materials and appliances. The materials are sold to the general public. The proceeds help local Habitat affiliates fund the construction of Habitat homes within their communities. Locations of ReStores can be found at: www.habitat.org/restores.

3.4 REVENUE

A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents.

- END SECTION –

5-0. WORK SCHEDULE

Contractor shall be responsible for providing a workable construction schedule that incorporates the following conditions:

1. The schedule for the work is subject to the approval of the Public Works Department.

2. All work shall take place Monday through Friday between the hours of 7:00 am and 4:00 pm unless previously approved by the Public Works Director, City Engineer, or Project Engineer for any other day of the week.

3. The Contractor shall coordinate all inspections and final sign-offs for permits and the project with Public Works Department staff.

6-0. EXAMINATION OF JOB SITE AND MEASUREMENT VERIFICATION

The BIDDER shall make a detailed physical inspection of the project site before submitting the proposal. It is understood that the BIDDER has thoroughly examined the specifications, sites and conditions under which work will be performed before submitting a proposal and has satisfied himself regarding existing conditions and existing access conditions which may affect bid prices for the proposed work.

Measurement Verification: Contractor shall verify all field measurements and determine quantities prior to ordering materials. Contractor shall procure all material and confirm all parts are onsite prior to beginning installation.

7-0. INSPECTION

Section 3-5 of the Specifications is supplemented by the following additional requirements:

1. On all questions relating to quantities, the acceptability of material, or work, the execution, progress or sequence of work, and the interpretation of specifications or plans, the decision of the Engineer or City Inspector is final and binding, and shall be precedent to any payment under the contract.

2. All work and materials are subject to inspection and approval of the Engineer or City Inspector.

3. Legible copies of material/weight certification shall be turned over to the City Inspector on a daily basis.

4. Inspection of the work shall not relieve the Contractor of the obligations to fulfill all conditions of the contract.

8-0. WORK AREA SAFETY

All work shall conform to all applicable State, local, regional and Federal codes, ordinances, and regulations as prescribed by the City.

1. The Contractor shall conform to the rules and regulations pertaining to safety established by the California Division of Occupational Safety and Health of the Industrial Relations Department (CAL-OSHA).

2. The CONTRACTOR shall place and maintain signs, cones, barricades, security fences, and other safety devices as needed for the safety of and the general public, City personnel, and the Contractor.

8-0. USE OF PRIVATE PROPERTY AND PROTECTION OF EXISTING IMPROVEMENTS

The use of any private property or utilities on private property by the Contractor is prohibited. The prohibited uses include, but not limited to Contractor's use of water, electricity or natural gas from the private property, and storage of material or equipment, and turning around/parking of his vehicles on private property.

1. Existing public and/or private improvements, adjacent property, utility and other facilities and trees and plants shall be protected from injury or damage.

2. Any damage to the facilities, public, or private property that takes place as a result of the contractor's work shall be repair or replaced to the City's satisfaction by the contractor at no cost to the City.

3. Access to driveway shall be maintained at all times for residents.

9-0. STORAGE OF MATERIALS AND EQUIPMENT

1. No material or equipment shall be stored in public right-of-way.

2. The contractor shall be responsible for obtaining a site for storage of material and equipment. The site shall not be within or adjoining the residential areas of the City. Site shall be subject to approval by the City.

3. The sites for stockpiling and batching materials shall be clean and free from objectionable material.

4. The City does not have nor does it guarantee any designated property within the City for storage of materials.

5. If the Contractor finds a private property for storage of his materials, the Contractor shall furnish the City a letter of approval and a letter of release (at the end of the job and cleanup of the storage site) from the property owner for this purpose.

10-0. DISPOSAL OF REMOVALS

There are no authorized dump facilities within the City of El Segundo. All removed material shall become the property of the Contractor and shall be legally disposed of by Contractor at the end of each work day away from the site of work.

11-0. PUBLIC WORKS ENCROACHMENT PERMITS AND BUILDING PERMITS

The Contractor will be required to apply and obtain applicable permits from the Public Works and Community Development Departments. The Contractor's work shall adhere to the City standards and applicable codes including the California Building Code, Plumbing Code, Electrical Code, and Mechanical Code. The Contractor shall call the Inspector at least 24 hours in advance for inspections.

All noted deficiencies on permits shall be corrected by contractor. The project will not be accepted as complete until contractor obtains a final sign-off for all permits.

12-0. NPDES COMPLIANCE

Contractor shall comply with the latest version of the Los Angeles Regional Water Quality Control Board (LA RWQCB) NPDES MS4 Permit for storm water and non-storm water discharges.

Contractor shall not discharge or permit to be discharged to any street, channel, river, storm drain, or any appurtenances thereof, any non-rain water or other liquid substance from the project or from operations pertaining to the project site, unless the discharge is specifically listed as exempt or conditionally exempt in the most current MS4 Permit issued by the Regional Water Quality Control Board, Los Angeles Region.

Contractor shall implement all necessary Best Management Practices (BMPs) to ensure that any conditionally exempt discharge meets all current requirements of the LA RWQCB MS4 Permit.

City may prohibit or restrict any discharge if, in its sole discretion, the discharge is polluting, unsafe, or causes a nuisance condition to be created.

Depending on the size of the project and/or construction activities of the project, the Contractor may be required to comply with the State Water Resources Control Board (SWRCB) Construction General Permit (Adopted Order 2009-0009-DWQ and subsequent amendments). Contractor shall refer to the SWRCB Construction General Permit for construction activities covered and be responsible for implementing requirements if subject to the Construction General Permit.

13-0. COMPLETION

Upon completion of work at each site, the Contractor shall conduct careful inspection with the City Inspector and shall correct all defective work to the satisfaction of the Owner.

The Contractor shall coordinate all inspections and final sign-offs for Encroachment Permits with City staff.

All scrap, litter and debris resulting from operations specified herein, shall be removed and the premises left in a clean and satisfactory condition.

14-0. WARRANTY

The Contractor and/or manufacturer shall warrant all work performed under this Contract for a minimum of one (1) years from the date of Owner's acceptance of completed job. Any defects in materials or workmanship appearing during this period shall be corrected without cost to the City.

- END OF SECTION -

APPENDIX A

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

TECHNICAL SPECIFICATIONS

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DIVISION 27 - COMMUNICATIONS

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SECTION 02 4116

DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Furnishing labor, materials and equipment necessary for demolition, dismantling, cutting and alterations as indicated, specified, or required for completion of the Work. Includes items such as the following:

1. Protection of existing improvements to remain.
2. Cleaning existing improvements to remain.
3. Disconnecting and capping utilities.
4. Removing debris, waste materials, and equipment.
5. Removal of items for performance of the Work.
6. Salvageable items to be retained by the Owner.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 01 1100 - Summary of Work.
3. Section 01 5000 - Construction Facilities and Temporary Controls.
4. Section 01 7329 - Cutting and Patching.
5. Section 01 7419 - Construction and Demolition Waste Management.
6. Division 22 –- Plumbing.
7. Division 23 –- HVAC.
8. Division 26 –- Electrical.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating the extent of items and systems to be removed. Indicate items to be salvaged or items to be protected during demolition. Indicate locations of utility terminations and the extent of abandoned lines to be removed. Include details indicating methods and location of utility terminations.

1.03 QUALITY ASSURANCE

A. Perform the Work of this section by workers skilled in the demolition of buildings and structures. Perform the Work of this section under direct superintendence at all times.

B. Prior to commencement of Work, schedule a walkthrough with the OAR, to confirm Owner property items have been removed from scheduled Work areas. Identify and mark remaining property items and schedule their removal.

C. Coordinate demolition for the correct sequence, limits, and methods. Schedule demolition Work to create least possible inconvenience to the public and facility operations.

D. Related Standard: ANSI/ASSE A10.6.

1.04 PROJECT CONDITIONS

A. Drawings may not indicate in detail all demolition Work to be performed. Examine existing conditions to determine the full extent of required demolition.

B. Repair damage to existing improvements or damage due to excessive demolition.

C. Provide all measures to avoid excessive damage from inadequate or improper means and methods, improper shoring, bracing or support.

D. If conditions are encountered that varies from those indicated, promptly notify the Architect for clarification before proceeding.

PART 2 - PRODUCTS

2.01 HANDLING OF MATERIALS

A. Items scheduled for salvage by the Owner shall be delivered to a location designated by the OAR. Items shall be cleaned, packaged and labeled for storage.

B. Items scheduled for reuse shall be stored on the Project site and protected from damage, theft and other deleterious conditions.

PART 3 - EXECUTION

3.01 GENERAL

A. Protection:

1. Do not commence demolition until safety partitions, barricades, warning signs and other forms of protection are installed. Refer to Section 01 5000 - Construction Facilities and Temporary Controls.

2. Provide safeguards, including warning signs, lights and barricades, for protection of workers, occupants, and the public.

B. If safety of existing construction appears to be endangered, take immediate measures to correct such conditions; cease operations and immediately notify the OAR.

3.02 DEMOLITION

A. Do not throw or drop materials. Furnish ramps or chutes as required by the Work.

B. Remove existing construction only to extent necessary for proper installation of Work and interfacing with existing construction. Cut back finished surfaces to straight, plumb or level lines as required for a smooth transition.

C. Where openings are cut oversize or in improper locations, replace or repair to required condition.

3.03 CUTTING EXISTING CONCRETE

A. Cutting of existing concrete shall be performed by skilled workers familiar with the requirements and space necessary for placing concrete. Perform concrete cutting with concrete cutting wheels and hand chisels. Do not damage concrete intended to remain.

B. Extent of cutting of structural concrete shall be as indicated on Drawings. Cutting of non-structural concrete shall be as indicated on Drawings or as reviewed by the Architect or structural engineer. Replace concrete demolished in excess of amounts indicated.

C. Prior to cutting or coring concrete, determine locations of hidden utilities or other existing improvements and provide necessary measures to protect them from damage.

3.04 REMOVAL OF EXISTING PLUMBING AND ELECTRICAL EQUIPMENT AND SERVICES

A. Remove existing plumbing and electrical equipment fixtures and services not indicated for reuse and not necessary for completion of the Work. Remove abandoned lines and cap unused portions of existing lines.

3.05 REMOVAL OF OTHER MATERIALS

A. Masonry: Cut back to joint lines and remove mortar without damaging units to remain. Allow space for repairs to backing where applicable.

B. Woodwork: Cut or remove to a joint or panel line.

C. Roofing: Remove as required, including accessory components such as insulation and flashings. At penetrations through existing roofing, trim cut edges back to sound roofing with openings restricted to the minimum size necessary to receive Work.

D. Sheet Metal: Remove back to joint, lap, or connection. Secure loose and unfastened ends or edges and provide a watertight condition. Re-seal as required.

E. Glass: Remove broken or damaged glass and clean rebates and stops of glazing channels.

F. Modular materials such as acoustical ceiling panels, resilient tile, or ceramic tile: Remove to a natural joint without leaving damaged or defective Work where joining

new Work. After flooring removal, clean substrates to remove setting materials and adhesives.

G. Gypsum Board: Remove to a panel joint line on a stud or support line.

H. Plaster: Saw cut plaster on straight lines, leaving a minimum 2-inch width of firmly attached metal lath for installing new lath and plaster.

I. Remove existing improvements not specifically indicated or required but necessary to perform Work. Cut to clean lines, allowing for installation of Work.

3.06 PATCHING

A. Patch or repair materials to remain when damaged by the performance of the Work of this section. Finish material and appearance of patch and/or repair Work shall match existing.

3.07 CLEANING

A. Clean existing materials to remain with appropriate tools and equipment.

B. Protect existing improvements during cleaning operations.

C. Debris shall be dampened by fog water spray prior to transporting by truck.

D. Debris pick-up area shall be kept broom-clean and shall be washed daily with clean water.

E. Remove waste and debris, other than items to be salvaged. Turn over salvaged items to Owner, or store and protect for reuse where required. Continuously clean up and remove items as demolition Work progresses.

F. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 05 4000

COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Exterior non-load-bearing wall and curtainwall framing.
2. Exterior and interior ceiling and soffit framing.
3. Interior non-load-bearing wall framing that exceeds gage and/or height limitations of standard nonstructural metal framing specified in Section 09 2216.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 01 4523 - Testing and Inspection.
3. Section 05 1200 - Structural Steel Framing.
4. Section 05 3000 – Metal Decking.
5. Section 05 5000 – Metal Fabrications.
6. Section 06 1643 - Gypsum Sheathing.
7. Section 07 8116 – Cementitious Fireproofing.
8. Section 07 8123 – Intumescent Fireproofing.
9. Section 07 8413 _ Penetration Firestopping.
10. Section 07 9200 – Joint Sealants.
11. Section 09 2900 – Gypsum Board.
12. Section 09 2216 - Non-Structural Metal Framing.
13. Section 09 2423 - Cement Plaster and Metal Lath.

1.02 REFERENCES

A. American Welding Society (AWS):

1. AWS D1.1 Structural Welding Code Steel.

2. AWS D1.3 Structural Welding Code Sheet Steel.

B. American Iron and Steel Institute:

1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.

2. AISI S202 – Code of Standard Practice for Cold-Formed Steel Structural Framing.

3. AISI S240 – North American Standard for Cold-Formed Structural Framing.

C. ASTM International:

1. ASTM A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

2. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by Hot Dip Process.

3. ASTM A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

4. ASTM A1003 – Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

5. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.

6. ASTM C404 – Standard Specification for Aggregates for Masonry Grout.

7. ASTM C150 – Standard Specification for Portland Cement.

8. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

9. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).

10. ASTM C1513 – Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

11. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

12. ASTM F1554 – Standard Specifications for Anchor Bolts, Steel, 36, 55 and 105-Ksi Yield Strength.

13. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

D. Underwriters Laboratory (UL):

1. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems.

1.03 PROJECT REQUIREMENTS

A. Regulatory Requirements: Comply with CBC requirements.

B. Performance Requirements:

1. Fire Resistance Ratings: Construct assemblies to achieve the fire resistance ratings indicated on Drawings. conform with applicable GA or UL, or design number indicated in the drawings.

2. Design framing systems in accordance with AISI S240 “North American Standard for Cold Formed Structural Framing”, except as otherwise shown or specified.

3. Deflection Limits for Partitions and Ceilings: Conform with CBC Table 1604A.3.

1.04 SUBMITTALS

A. Shop Drawings: Submit drawings showing framing, connection details, accessories and anchorage. Indicate location of assemblies, size and spacing of framing components. Show reinforcing channels, opening support framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

B. Delegated-Design Submittal: Submit design calculations stamped by a professional engineer licensed in the state of California.

C. Product Data: Submit manufacturer's technical catalog data for each item proposed for installation.

D. Code Compliance Certifications of Studs and Tracks: Provide documentation that framing members are certified in accordance with product-certification program of the Certified Steel Stud Association (CSSA) or the Steel Framing Industry Association (SFIA).

E. Product Test Reports:

1. Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

2. For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.

    a. Steel sheet.

    b. Expansion anchors.

    c. Power-actuated anchors.

    d. Mechanical fasteners.

    e. Vertical deflection clips.

    f. Horizontal drift deflection clips

    g. Miscellaneous structural clips and accessories.

F. Research Reports:

1. Steel framing manufacturer shall have third-party evaluation reports for its products meeting the CBC and AISI S100 requirements.

2. Submit ICC-ES Research/Evaluation Reports for post-installed anchors.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a member of the Steel Framing Industry Association (SFIA) or the Steel Stud Manufacturers Association (SSMA).

B. Products shall be certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS Accreditation Criteria for Inspection Agencies.

C. Installer: Minimum three years' experience in performing work of this Section on similar projects.

D. Comply with AISI S100 and AISI S240 Specifications and Standards.

E. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. Welds shall be performed by AWS certified welders. Welding shall be performed in accordance with the requirements of the AWS D1.1 and D1.3.

2. The Project Inspector shall be responsible for monitoring the work of special inspector to ensure that the inspection program is satisfactorily completed.

F. Pre-installation Meetings:

1. Conform to requirements of Section 01 3119 Project Meetings.

2. Review the quality control and construction requirements and to determine the procedures for producing proper installation, review requirements for submittals, coordination of work with related trades and availability of materials.

G. Caulking, sealants, primers, adhesives, coatings and paints must be approved by the OWNER's Office of Environmental Health and Safety (OEHS).

H. Coordinate with related Work to provide blocking for items mounted on finished surfaces and to provide allowances for pipes and other items inside partitions and walls.

1.06 DELIVERY, STORAGE AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling, as required in AISI S202. Do not store material directly on grade. Provide adequate support to prevent bowing of material prior to installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide cold formed metal framing shapes and accessories manufactured by one of following:

1. ClarkDietrich.

2. Marino/Ware.

3. CEMCO.

4. The Steel Network.

5. Equal products by manufacturers members of the Steel Framing Industry Association (SFIA) or the Steel Stud Manufacturers Association (SSMA).

2.02 MATERIALS

A. Framing Members, General: Comply with AISI S240 for conditions indicated.

1. Studs, tracks, slotted deflection tracks, furring channels, u-channels, z furring, angles, straps, web stiffeners, bridging and miscellaneous members and accessories shall be cold formed to shape from sheet steel, conforming with AISI S240 and ASTM A1003 Structural Grade, Type H, with a protective G60 coating conforming with ASTM A653.

2. Steel Sheet for clips, such as vertical deflection, drift, rigid, and foundation shall conform with AISI S240 and ASTM A1003 with a protective G90 coating conforming with ASTM A653.

B. Yield strength shall be 50 Ksi minimum for 16-gauge (43-mils, 0.0538 inch) members and heavier and 33 Ksi minimum for 18 gauge (54-mils, 0.0428 inch) and lighter, unless otherwise indicated in the drawings.

C. Gauges and structural properties of cold formed metal framing shapes shall be as indicated in the Drawings.

D. Provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E119.

E. Sound-Rated Assemblies: For sound transmission coefficient (STC) rated assemblies, provide materials and construction identical to those tested in the assembly indicated, in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.

2.03 STEEL STUDS

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges. Studs shall be provided in standard widths of 4, 6 8 inches and in 16 (54-mils, 0.0538”), 14-gage (68-mils, 0.0677”) and 12-gage (97-mils, 0.0966”) sheet minimum base thickness, as required by Project conditions and detailed.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching properties of steel studs.

C. Steel Single- or Double-L Headers: Manufacturer's standard L-shapes used to form header beams, of web depths required, and with minimum base steel thickness, flange width and section properties required to meet design requirements.

D. Steel Box or Back-to-Back Headers: Manufacturer's one-piece members, or standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and with minimum base.

2.04 CEILING JOIST AND SOFFIT FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, **[unpunched,] [punched with enlarged service holes,] [punched with standard holes,]** with stiffened flanges, and with minimum base steel thickness, flange width and section properties required to meet design requirements.

B. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and with minimum base steel thickness, flange width and section properties required to meet design requirements.

2.05 DEFLECTION TRACKS AND DEFLECTION CLIPS

A. Deflection and Drift Clips: Shall be ASTM A1003 Structural Grade 50 Type H 50ksi Coating G90 hot-dipped galvanized coating with section properties as required to meet design requirements.

1. System shall provide for minimum tested overall movement of 3/4-inch up and 3/4"-inch down, or as indicated on the Drawings. Fasteners shall allow friction-free deflection.

2. Track shall meet the movement and cycling requirements of UL 2079 and shall be UL Classified for the fire-resistant ratings in head-of-wall fire-rated joint systems indicated in the Drawings.

B. Double Deflection Track: Two-piece assembly consisting of a custom outer track with deep legs installed on the underside of the structure designed to receive an inner track that holds the wall studs, as indicated on the Drawings. System shall provide for minimum tested overall movement of 3/4” up and 3/4" down, or as indicated on the Drawings.

C. Slotted Deflection Tracks:

1. Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges. designed to accommodate vertical movement of the building’s floor/ceiling or roof/ceiling deck, for non-rated and fire-rated applications. Include related framing accessories and fasteners, for a complete assembly.

2. Track shall be provided in standard widths of 4, 6 8 inches and in 16 (54-mils, 0.0538”), 14-gage (68-mils, 0.0677”) and 12-gage (97-mils, 0.0966”) sheet steel thickness, as required by Project conditions and detailed.

2.06 ANCHORS, CLIPS AND FASTNERS

A. Steel Shapes and Clips: ASTM A1003 Structural Grade 50 Type H 50ksi Coating G90 hot-dipped galvanized coating with section properties as required to meet design requirements.

B. Post-Installed Concrete Anchors: Adhesive or expansion anchors fabricated from corrosion-resistant materials.

C. Power-Actuated Fasteners: Fabricated from corrosion-resistant materials with allowable load capacities in accordance with ICC-ES AC 70.

D. Bolts:

1. ASTM A307 coated by hot-dip process per ASTM F2329 or zinc-coated by mechanical-deposition process per ASTM B695, Class 55. Bolts and nuts shall be coated by the same zinc-coating process.

2. Anchor Bolts: ASTM F1554, Grade 36 or Grade 55 as indicated in the drawings, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated.

E. Welding Electrodes: Comply with AWS standards.

2.07 MISCELLANEOUS MATERIALS

A. Framing Accessories: Fabricate steel-framing accessories from steel sheet, ASTM A1003, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members. Provide standard related accessories including cold-rolled furring channels, Z-shaped furring, bridging, web stiffeners, and similar items, of same manufacture as each type of stud specified, and as required for a complete installation.

B. Backing: Provide sections of studs and tracks welded or fastened to stud flanges or manufacturer made products specifically for this purpose.

C. Refer to Section 05 5000, Metal Fabrications, for miscellaneous steel shapes, masonry shelf angles, and connections used with metal framing.

D. Plastic grommets for stud webs as recommended by stud manufacturer, to protect electrical wires and plumbing piping. Prevent metal-to-metal contact between wiring/piping and studs.

E. Grout:

1. Cement Grout: Portland cement, ASTM C150, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

2. Nonmetallic, Non-shrink Grout: Premixed, nonmetallic, noncorrosive, non-staining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C1107, with fluid consistency and 30-minute working time.

F. Shims: Load bearing, high-density multi-monomer plastic, and non-leaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

G. Sealer Gaskets: Closed-cell neoprene foam, 1/4-inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

H. Acoustical Sealant: As specified in Section 07 9200.

I. Galvanizing Repair Paint: Per ASTM A780, Carbomastic 15, by Carboline or equal product approved by OWNER’s OEHS.

2.08 FABRICATION

A. Framing components may be preassembled into panels prior to erection. Fabricate panels square, with components attached to prevent racking and minimize distortion during lifting and transport. Cut framing components square for attachment to perpendicular members or as required for angular fit against abutting members.

B. In doubled jamb studs and doubled headers not accessible for insulating, provide insulation equal to thicknesses specified elsewhere.

C. Splices in members other than top and bottom runner track are not permitted.

D. Provide temporary bracing required until erection is completed.

PART 3 - EXECUTION

3.01 PREPARATION

A. Examine structure, substrates and installation conditions. Do not proceed with metal stud framing installation until unsatisfactory conditions have been corrected.

B. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials, in such a way as to maintain the fire-resistance required.

C. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

D. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.

3.02 INSTALLATION

A. General Erection Requirements:

1. Install cold-formed framing in accordance with requirements of ASTM C1007, manufacturer's written instructions, and in compliance with applicable sections of the AISI 240.

2. Connections:

a. Screw fasteners for steel-to-steel connections shall conform with ASTM C1513 and shall be corrosion-resistant-coated, self-drilling, self-tapping steel screws of the type and size indicated. Provide low-profile head beneath sheathing and gypsum board and manufacturer's standard elsewhere. Screw penetration through joined materials shall not be less than three exposed threads.

b. Welds shall perform in accordance with AWS D.1.3, as modified by AISI S100. All welds shall be cleaned and coated with rust inhibitive galvanizing paint.

c. Bolted cold-formed steel connections shall be designed and installed in accordance with AISI S100

d. Cold-formed steel connections using power-actuated fasteners shall be designed and installed in accordance with AISI S100.

B. Install plumb and true. Install necessary accessories for proper installation.

C. Anchor top and bottom runner track to structure overhead and to floor structure below. Install sealer gasket under bottom of track on concrete slab or foundation. Anchor

tracks as indicated in design calculations. Butt weld joints in tracks or splice with stud inserts.

D. Install studs squarely in top and bottom runner track with firm abutment against track webs. Fasten studs to flanges of both top and bottom runner tracks. Position studs vertically in tracks and space as indicated in Construction Documents. Do not splice studs. Space studs as indicated on the Drawings.

E. Provide three studs minimum at corners of stud walls. Locate so as to provide surfaces for attachment of interior and exterior facing materials.

F. Framed wall openings shall include headers and supporting components as shown on the drawings. Headers shall be installed in all openings that are larger than the stud spacing in a wall. In curtain wall construction, provide for vertical movement where studs connect to the structural frame. Provide horizontal bracing in accordance with the design calculations and AISI S100 and as indicated on the Construction Documents.

G. Members not indicated to be welded together shall be attached with manufacturer recommended ASTM C1513 screws with minimum one screw at each flange of stud to top and bottom track.

H. Wire tying of framing members is not permitted.

I. Intersecting walls and partitions, whether load bearing or not, shall be connected.

J. Splices in axially loaded studs are not permitted.

K. Splice or butt weld butt joints in runner tracks. No splices are permitted in tracks over lintels, diaphragm sheathing, or diagonal bracing.

L. Weld connections by fillet welds or plug welds in accordance with AWS recommended procedures and practices.

M. Touch-up field abrasions and welds on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.

N. Studs that frame door openings shall be clipped to floor with 14-gage (68-mils, 0.0677” base-steel thickness) angle clips or manufacturer made products specifically for this purpose. Each end clip to have two fasteners into studs and two fasteners into floor.

O. Space joists as indicated on the Drawings. Provide web stiffeners and joist bridging where indicated on the Drawings. Install end blocking where joist ends are not restrained from rotation.

P. Provide additional joists or blocking adjacent to exterior and interior walls, openings and elsewhere as required to provide support for indicated ceiling construction.

3.03 CONNECTIONS TO METAL DECKING

A. Provide pre-molded neoprene filler strips matching flute profile for non-fire-rated walls and partitions covered on one or both sides up to metal decking.

B. Top runner track of fire-rated partitions shall be a minimum of 16-gage (54-mils, 0.0428-inch base-steel thickness), unless noted otherwise, and attached to metal deck with required fasteners at spacing required for fire rating, but in no case over 16 inches on center. Areas above runner shall be friction fit with a minimum depth of 2 1/2 inches of 4 pounds per cubic foot density mineral wool insulation. A minimum of 1/2 inch of firestopping compound shall be installed to each side of mineral wool insulation for a one-hour system, and one inch of firestopping for a two-hour system. Install required special tracks, angles, fasteners and strips of gypsum wallboard to provide required fire resistance rating.

C. Fire-rated top tracks shall be installed in accordance with manufacturer's recommendations and fire rating approval requirements.

3.04 QUALITY CONTROL

A. Welding Inspection:

1. Inspection of field welding operations shall be performed by special inspector.

2. The special inspector shall inspect material, equipment, procedures, welds, and welder qualifications.

B. Tolerances: Install walls on straight lines, plumb, free of twists or other defects, and contacting a 10-foot straight edge for its entire length at any location within a 1/8-inch tolerance. Install horizontal framing level within a tolerance of 1/8-inch in 12 feet in any direction.

3.05 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

3.06 PROTECTION

A. Protect Work of this section until Substantial Completion.

END OF SECTION

SECTION 06 2000

FINISH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Finish carpentry.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 06 1000: Rough Carpentry.
3. Section 06 4000: Architectural Woodwork.
4. Section 08 1416: Flush Wood Doors.
5. Section 08 7100: Door Hardware.
6. Section 08 8000: Glazing.
7. Section 09 2900: Gypsum Board.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings of each item of finish carpentry and millwork, indicating materials, dimensions, construction, and anchorage details.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. Douglas fir finish lumber shall be manufactured and graded in accordance with WCLIB - Standard Grading and Dressing Rule No. 17.
2. Redwood finish lumber shall be manufactured and graded in accordance with RIS - Standard Specifications for Grades of California Redwood Lumber.
3. Hardwood finish lumber shall be manufactured and graded in accordance with NHLA - Rules for the Measurement and Inspection of Hardwood and Cypress Lumber.

4. Softwood Plywood: Plywood shall comply with APA - Product Standard PS 1. Plywood shall be grade marked by APA.

5. Products and installation shall comply with the North American Architectural Woodwork Standards (NAAWS) for the Grade or Grades specified.

B. Finish lumber shall be kiln-dried according to recognized methods for the thickness and species. Lumber one inch thick or less shall be dried to an average moisture content of not more than 13 percent. Lumber 1-1/4 inches to 2 inches in thickness shall be dried to an average moisture content of not more than 15 percent.

1.04 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in undamaged condition, stored in fully covered, well ventilated areas, and protected from extreme changes in temperature and humidity.

B. Interior millwork and finish carpentry shall not be installed unless interior building temperature and humidity levels are within the ranges recommended by the manufacturer and/or recognized standards.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Douglas Fir: Interior trim, solid lumber shelves, partitions, door frames and other concealed members of interior finish; NAAWS Economy Grade.

B. Hardwood: Birch, maple firsts and seconds.

1. Birch: NAAWS Custom Grade.

2. Maple: NAAWS Custom Grade.

C. Softwood Plywood: Except where otherwise specified, AWI Custom Grade, Douglas fir unless otherwise indicated.

D. Hardwood Plywood: NAAWS Premium Grade, species as indicated.

E. Redwood: Exterior millwork, except framing lumber, shall be clear heartwood redwood. Where installed in direct contact with earth or provided for exterior storage units, install Foundation Grade.

F. Perforated Hardboard Panels: Panels shall be 1/4 inch thick tempered hardboard, SIS with 1/4 inch diameter holes spaced one inch on center.

2.02 FABRICATION

A. The means of fastening various parts together shall be concealed in finished Work. Work which is curved shall be fabricated from solid stock, or if veneered, shall be bent to a uniform radius.

PART 3 - EXECUTION

3.01 GENERAL

A. Interior and exterior wood, millwork, blocking, and lumber shall be installed level, plumb, and true to line. Members shall be neatly and accurately scribed in place, maintaining full widths of end members, wherever possible. Trim shall be installed in full lengths, without piecing, except where use of single lengths is not required. Butt joints, if necessary, shall be beveled. Exterior angles shall be mitered, and interior angles of molding parts coped. Nails shall be set for putty. Grain and color of adjoining interior finish shall match adjacent finishes. Where Work specified in this section adjoins other Work, provide a neat tight joint.

B. Interior and exterior finish carpentry and other fixed wooden equipment having hammer marks or other visible damage will be deemed defective Work.

C. Staff or brick moulds of exterior wood doorframes shall be attached to frames after frames have been set and caulked. Moulds shall be mitered at corners and coped to sills, accurately secured in place with finish nails, and nails set.

3.02 INSTALLATION

A. Install Work of this section as specified in the North American Architectural Woodwork Standards.

B. Wood shoe base shall be fitted and temporarily tacked in place until floor covering is installed. Provide and install corner fillets, same contour and materials as shoe base, in corners where shoe base is installed.

C. Platform Front: Plywood at platform front and adjoining steps in Multi-Purpose Building shall be provided with face veneers of unselect birch. Trim and frames shall match face veneer of panels. Joints shall be V-shaped where indicated.

D. Door Frames: Frames shall be installed plumb and true, solidly blocked, reinforced for butts and hardware, and shall be fastened to structural frame with 16d set finish nails at not more than 24 inches on centers. Nails securing exterior door and window frames shall be cement coated. Doorframes shall be dadoed together at the head.

E. Sealing of Joints: Joints between exterior frames and adjoining surfaces shall be primed before sealing.

3.03 CLEAN UP

A. Remove debris, rubbish and waste material and legally dispose of off the Project site.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 06 4000

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Architectural woodwork, casework, trim, hardware, countertops, and shelving as indicated on Drawings.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 06 1000: Rough Carpentry.
3. Section 06 2000: Finish Carpentry.
4. Section 08 8000: Glazing.
5. Section 09 9000: Painting and Coating.
6. Section 10 1100: Visual Display Units.
7. Section 22 1000: Plumbing.

1.02 DEFINITIONS

A. "Sustainably managed" is defined as "forests that are being managed through a professionally administered forestry management plan in which timber growth equals or exceeds harvesting rates in both quantity and quality, protecting rivers and streams from degradation, minimizing damage to the forest when harvesting and promoting biodiversity".

1.03 SYSTEM DESCRIPTION

A. Design Requirements: Provide wood products from certified sustainably harvested sources.

1.04 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings of casework indicating materials and hardware, details of construction, dimensions, methods of fastening and installation details. Shop Drawings shall bear a Woodwork Institute (WI) Certified Compliance Label indicating that Shop Drawings fully meet requirements of the North American Architectural Woodwork

Standards (NAAWS) grade or grades specified. Shop Drawings shall indicate grounds, backing, blocking, sleepers and other items required for installation of casework, which are to be provided and installed as part of the Work.

B. Certificates: Provide a WI Certified Compliance Certificate certifying that materials, fabrication and installation will comply with the specified requirements.

C. Material Samples: Submit 2-inch by 3-inch plastic laminate and solid surfaces color Samples of manufacturer's entire color range.

D. Submit manufacturer’s product data for adhesives and finishes. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.

E. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.

F. Closeout Submittals: Provide a WI Certified Compliance Certificate for Installation.

1.05 QUALITY ASSURANCE

A. Comply with the North American Architectural Woodwork Standards (NAAWS), latest edition, published jointly by the Architectural Woodwork Manufacturer’s Association of Canada and the Woodwork Institute of California, grades as specified herein.

B. Each elevation of casework shall bear a WI Certified Compliance Label indicating that casework fully meets requirements of the AWS grade specified.

C. Each plastic laminate countertop and/or solid surface top shall bear a WI Certified Compliance Label indicating tops fully meet requirements of the AWS grade specified.

D. Mock-ups: When required by the Architect, submit a full-scale base cabinet, countertop, and wall-hung cabinet, illustrating joinery and plastic laminate finish. Base cabinet shall incorporate a drawer, an adjustable shelf, and a door. Wall-hung cabinet shall incorporate two doors, one adjustable shelf and finished end, including required hardware.

1.06 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in undamaged condition, stored in fully covered, well ventilated areas, and protected from extreme changes in humidity and temperature. Refer to the North American Architectural Woodwork Standards (NAAWS) for recommended care and storage.

B. In event of damage immediately furnish necessary repairs or replacements.

1.07 PROJECT CONDITIONS

A. Store indoors, in ventilated areas with constant but minimum temperature of 60 degrees F. and maximum relative humidity of 25 percent to 55 percent. Do not install casework until building is enclosed and ambient conditions are within the temperature and humidity range to be expected during occupancy. Acclimatize materials to the installation temperature and humidity for at least 72 hours prior to installation. Maintain conditions until Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic Laminate Faced Cabinets:

1. Plastic laminate: High pressure plastic laminate conforming to NEMA standard LD-3; Grade HGS 0.048 inches at horizontal surfaces, Grade VGS 0.028 inches at exposed vertical surfaces and edge bands, and HGP 0.039 inch minimum for post-formed countertops.

2. Particle Board Core Material: 45 lb. density, conforming to ANSI A208.1, Table 1, Grade 1-M-2.

3. Solid Lumber:

   a. Solid lumber for exposed members, drawers, trays and special details shall be Clear birch or maple.

   b. Unexposed solid lumber for concealed webs or structural members shall be of Douglas Fir., alder or birch.

4. Softwood Plywood: Rotary cut exterior type A-C grade softwood plywood complying with PS1.

5. Hardboard: Factory finished pressure sealed hardboard conforming to the requirements of PS 58. Oil tempered hardboard shall conform to CS 251.

6. Cabinet Liner: Semi-exposed surfaces shall be finished with 0.020 inch high-pressure laminate cabinet liner, conforming to NEMA Standard LD-3.

7. Edge Banding:

   a. T-type extruded tenite-butyrate 1/16 inch minimum thickness, with serrated leg 3/8 inch in length. Use only when matching existing.

   b. 0.028 inch minimum thickness plastic laminate.

   c. PVC, 0.6 mm at cabinet sides, top, bottom divisions and shelves, 3 mm at doors, drawer fronts and false fronts.

8. Glass Doors: 1/4 inch laminated safety glass.

9. Adhesive: Type II water-resistant, rigid type glue of formula conforming to PS 51.

10. Sealer: Thompson Water Seal 101, Watco Oil, Zinsser, or equal.

11. The Owner will supply tote trays unless otherwise indicated.

12. Base: Cover toe spaces with typical wall base unless otherwise indicated.

B. Wood Casework:

1. Sheets:

a. Medium Density Fiberboard (MDF): ANSI A208.2.

b. Medium Density Overlay (MDO): APA PS-1.

c. Hardwood Plywood: ANSI/HPVA – HP–1.

2. Solid Lumber:

a. Concealed portions: Any species of sound, dry, solid stock.

b. Semi-exposed portions: Hardwood veneer of the same species as exposed material with a specific gravity in excess of 0.37.

c. Exposed portions: Select White Birch, well matched for color and grain.

3. Hardboard: Factory finished, pressure sealed hardboard conforming to requirements of PS 58.

4. Edge Banding: Same species of wood as adjacent to exposed surfaces.

C. Countertops:

1. 3/4 inch 1-M-2 grade particleboard, ANSI A208.1.

2. Medium Density Fiberboard (MDF): ANSI A208.2.

3. Solid Surfaces: Filled cast polymeric resin panel, with homogeneous composition throughout its thickness.

a. Corian.

b. Formica.

c. Wilsonart.

d. Equal.

D. Hardware:

1. Drawer Slides for Custom Grade Cabinetry:

   a. Pencil drawers: Full extension type: Accuride 2006, Blum, Hafele, or equal.

   b. Drawers and box drawers, up to 24 inches wide: Accuride 3832E, Blum, Hafele, or equal.

   c. Lateral file drawers, up to 30 inches wide: Accuride 4034 overtravel or 4033 equal travel, Blum, Hafele, or equal.

   d. Lateral file drawers, more than 30 inches wide: Accuride 3640, Blum, Hafele, or equal.

2. Drawer Slides for Premium Grade Cabinetry:

   a. Pencil drawers: Full extension type: Accuride 2632, Blum, Hafele, or equal.

   b. Drawers and box drawers, up to 24 inches wide: Accuride 7432, Blum, Hafele, or equal.

   c. Lateral file drawers, up to 30 inches wide: Accuride 4034 overetravel or 4033 equal travel, Blum, Hafele, or equal.

   d. Lateral file drawers, more than 30 inches wide: Accuride 3641, Blum, Hafele, or equal.

3. Flipper Door Slides for Premium and Custom Grade Cabinetry:

   a. For vertically mounted retracting cabinet doors up to 75 pounds and 72 inches tall: Accuride 1432, Blum, Hafele, or equal, with hinge carrier strip.

4. Door Mutes: Rubber, approximately 1/4 inch diameter, colors to match adjacent finish.

5. Plastic Grommets: Doug Mockett, Alliance Express, Rockler, or equal; color as selected by Architect.

6. Adjustable Shelves with Clips: Adjustable shelf supports (EDP type, unless otherwise noted) set in 5 mm holes spaced 32 mm on center:

   a. Hafele America, Co., No. 282.04.711, Blum, Hettich, or equal.

   b. Hafele America, Co., No. 282.24.13, Blum, Hettich, or equal.

7. Hinges: Five-knuckle overlay hinge with hospital tip - Rockford 376, or equal.

8. Cabinet Locks:

a. Door Locks: Pin tumbler type – CompX National No. C8173, Olympus 100DR x 12-1 strike, CCL Security Products, or equal.

b. Locks for Sliding Doors: National No. C8142 x thimble strike, Olympus 300 SD x thimble strike, CCL Security Products, or equal.

c. Drawer Locks: CompX National C8179brass strike, Olympus 200 DW x 12-1 strike, CCL Security Products, or equal.

d. Cabinet locks shall be flush with surface of door and protrude no greater than 3/16 inch.

9. Top-hung Hardware Assembly for Sliding Doors: Grant No. 6064, Hafele, Blum, or equal.

10. Track for Sliding Doors: K & V 455 x or 455.55, Hafele, Blum, or equal.

11. Pull Flush Ring at Drawers behind Doors: Safe No. 6116, Trimco 24, Quality, or equal.

12. Pulls: Quality No. 179 x 180, Trimco No. 553P, Hafele, or equal.

13. Catches: Magnetic type - Epco No. 592, Lawrence No. SC1364-AL, or equal.

14. Four-way Tension Catch: Glynn-Johnson GJ21A, Trimco, Quality, or equal.

15. Noiseless Catch:

16. Elbow Catch: Schlage SP2A3, or equal.

17. Bolts: Surface type, Quality B6, Trimco No. 4856-6, or equal.

18. Brackets and Shelf Strip for Glass Shelves: K & V No. 80 x 180, Garcy 604 x 686, or equal.

19. Shelf Standards and Brackets: K & V No. 255 x 256, line bored holes for pins as approved by AWI Standards Stanley No. 798 x 799, steel zinc plated, or equal.

20. Card Holders for Drawers: Corbin No. 1913-1/4H, Garcy No. 853, or equal.

21. Hanger Rods: 1-1/16 inches minimum diameter metal tubing, aluminum or stainless steel clad, KV660; heavy wall steel tubing KV770, Stanley, or equal.

22. Hanger Rod Flanges: KV757, or flanges KV734, KV735; Ronther Reiss R44-55; or equal.

23. Hardware Finish: With exception of finish hardware items which have finishes specified, hardware shall be furnished with dull chrome US 26D or dull stainless steel US 32D finish.

24. Keying:

a. Key locks inside one room alike. Furnish three keys for each lock keyed separately, and 2 keys for each lock in keyed alike groups. Master keys shall be tagged and delivered to the Inspector. Locks and keys shall be stamped with coded set number / direct digit.

b. Master keys shall be National GM2.

2.02 FABRICATION

A. Plastic Laminated Casework: Construction of plastic laminated casework shall conform to the material and construction requirements for North American Architectural Woodwork Standards Custom grade, flush overlay construction, except, modified as follows:

1. Exposed Exterior surfaces shall be High Pressure Decorative Laminate grade VGS.

a. Edge Band: PVC 1 mm. for cabinet body and 3 mm. at doors and drawer fronts.

2. Exposed Interior surfaces: Interior surfaces of open cabinets shall be laminated to match exteriors. Cabinets with glass doors shall use cabinet liner grade CLS.

3. Semi-exposed Surfaces: Shall be cabinet liner grade CLS and edges of panels shall be edge banded per 2.01 A.

4. Cabinet bases may be integral or separate. Bases shall be 3/4 inch thick plywood securely jointed at four corners to a supporting block 1 ½-inch thick.

5. Adjustable shelving shall be 3/4 inch thickness particleboard for spans up to 25 inches and one inch thickness for spans over 25 inches up to 34 inches. Adjustable shelving over 34 inches in span shall be one inch thick plywood core with 0.020 inch cabinet liner grade CLS both sides. Shelving hardware shall be adjustable to 1 1/4 inch centers. Faces of shelving shall be finished with 0.020 inch thickness cabinet liner grade CLS both sides.

6. Drawers:

a. Drawers shall be of dovetail or dowel construction. Sides, backs and sub-fronts shall be made of 1/2 inch thick clear birch or maple solid stock, or 9 ply plywood without knots or interior voids. Drawer bottoms shall be in accordance with AWI requirements, glued and nailed.

b. Drawers shall be fitted with ball bearing slides accurately installed for smooth drawer operation.

c. Drawer fronts shall be of 3/4 inch thick plastic laminate construction, fully edge-banded with plastic laminate T-banding to be used when matching

existing. T-banding joint shall occur at center of bottom edge of panel.

7. Doors:

   a. Doors shall be of flush overlay type. Doors shall be fully edge-banded. Doors of cabinets within any group of adjacent units shall be in alignment.

   b. Wrap around hinges shall be routed into edge of door.

8. Back Priming: Seal unfinished materials installed for backs, bases, self-edge backing, stripping and other concealed portions with a water-repellent sealer.

9. Banding:

   a. Edge banding shall be accurately fitted. Where edge band joins plastic surfaces, there shall be no open spaces, voids, or chipping of plastic laminate surface.

   b. Exposed cabinet surfaces shall be flush, and any protruding edges of banding shall be machined or trimmed to provide a flat smooth corner at intersection of banding and adjoining surfaces. Plastic laminate edge banding shall be installed on tops, webs, bottoms, ends, and inside partitions. T banding may only be installed on drawer fronts and door edges and when required to match existing.

B. Wood Casework: Manufacture in accordance with AWI Architectural Woodwork Standards, Custom Grade, except, modified as follows:

1. Exposed surfaces for transparent finish shall be plain sliced select white birch.

2. Exposed Interiors: surfaces at the interiors of open cabinets and cabinets with glass doors shall be of the same species and grade as exposed portions.

3. Semi-exposed surfaces shall be natural birch.

4. Edge banding shall be wood edge bands of same species as adjacent exposed faces.

5. Cabinet doors shall be particleboard core a minimum of 3/4 inch thickness, unless otherwise noted. Interior faces of cabinet doors shall be same species and grade as exposed surfaces. Cabinet doors shall be flush overlay.

C. Countertops:

1. Plastic Laminate Tops: Each plastic laminate countertop shall bear the WI Certified Compliance Label.

   a. Laminated plastic countertops shall be self-edged. Edge shall rise 1/8 inch above counter surface and back and return splashes shall be 6 inches high measured from exposed countertop surface, unless otherwise indicated.

b. Cove and roll front sticking, for plastic laminate back-up, shall be kiln dried clear sugar pine glued to core material. c. Square butt splashes, including end splashes shall be Deck Mount. Splashes shall be end applied and be set in mastic and secured to top with screws 8 inches on centers. Splash edges shall be self-edged and scribed to wall.

c. Joints shall be splined and fastened with screw clip fasteners on at least 8 inch centers. Water resisting mastic or glue shall be applied in joints. Joints shall not occur at sink cutouts. Sink cutouts shall be sealed.

d. Core material for counters and splashes shall be 3/4 inch thick Grade 130 MR50 MDF.

e. Installation of plastic laminate shall be in accordance with published specifications and recommended practices of the plastic laminate manufacturer.

2. Hardwood Countertops:

a. Hardwood counters shall be fabricated of Number One Clear birch or maple boards from 6 inches to 10 inches wide, of thickness indicated, tongued and grooved, and glued together with waterproof glue, reinforced with cleats or other method to prevent warping or opening of joints. Top surfaces where indicated shall be shaped to drain towards sink, with slope of 1/4 inch.

b. Back, ends and caps shall be 3/4 inch thick, with wide sections constructed same as top without reinforcing strips. Joints between top, back, and vertical corners of back where indicated, shall be fabricated of tongue and groove cove members and glued. Sinks, where indicated, shall be set flush with bottom of drainboards and caulked continuously.

3. Tempered Hardboard Tops: Countertops, backs and ends where indicated hardboard shall be covered with 1/8 inch thick tempered hardboard, installed on both sides of 1/2 inch softwood plywood core. Material shall be installed under pressure with waterproof cement of type recommended by hardboard manufacturer.

4. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.

a. Manufacturers:

1. Avonite Surfaces.

2. E. I. du Pont de Nemours and Company.

3. Formica Corporation.

4. Wilsonart International.

5. Equal.

b. Type: Provide Standard Type.

c. Integral Sink Bowls: Comply with ISSFA-2 and ANSI Z124.3, Type 5 or Type 6, without a precoated finish.

d. Colors and Patterns: As selected by Architect from manufacturer's full range.

e. Butt splash or seamless (coved) backsplash.

f. Provide drip groove.

2.03 FINISHING

A. Wood casework and wood components of laminated plastic casework shall be factory finished. Exposed surfaces shall be finished with one coat of lacquer sealer and 2 coats of finish lacquer. Unexposed materials such as backs, webs, back of tops, and the like, shall be sealed with one oil base prime coat. Semi-exposed wood surfaces such as drawers shall be finished with one coat of sanding sealer and one coat of clear gloss lacquer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install Work of this section as specified in the North American Architectural Woodwork Standards (NAAWS), grade to match the grade of the work to be installed.

B. Cabinets: Install cabinets level, plumb, and secure to walls. Exposed screws shall have finish washers.

C. End Panels and Fillers: Furnish to match exposed surfaces and accurately scribe to walls and neatly and securely fit to cabinets.

D. Completion: Upon completion of installation, cabinets including drawers and shelves shall be cleaned. Doors and drawers shall operate easily and freely.

E. Scribe plastic laminated cabinets to walls. Installation of surface-applied moldings is not permitted.

F. Coordinate sink and penetration locations with 22 1000 Plumbing.

G. Install solid surface countertops per NAAWS custom grade.

3.02 CLEAN UP

A. Remove debris, rubbish and waste material and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 2216

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Non-structural interior partitions.
2. Suspended and framed interior ceilings and soffits.
3. Grid suspension systems for gypsum board ceilings.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 05 4000 - Cold Formed Metal Framing.
3. Section 05 5000 – Metal Fabrications.
4. Section 07 8116 - Cementitious Fireproofing.
5. Section 07 8413 - Penetration Firestopping.
6. Section 07 9200 – Joint Sealants.
7. Section 09 2423 - Cement Plaster and Metal Lath.
8. Section 09 2900 - Gypsum Board.

1.02 REFERENCES

A. ASTM International:

1. ASTM A641 – Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire.
2. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
3. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
4. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

5. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

6. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

7. ASTM E413 – Classification for Rating Sound Insulation.

8. ASTM F1941 - Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.

B. American Iron and Steel Institute:

1. AISI S202 - Code of Standard Practice for Cold-Formed Steel Structural Framing.

2. AISI S220 - North American Standard for Cold Formed Steel Framing – Nonstructural Members.

C. Underwriter Laboratories (UL):

1. UL 2079 - Standard for Safety Tests for Fire Resistance of Building Joint Systems.

D. American National Standards Institute, Inc. / Underwriters Laboratories:

1. ANSI C80.3 / UL 797 - Electrical Metallic Tubing-Steel (EMT-S).

1.03 PROJECT REQUIREMENTS

A. Regulatory Requirements: Comply with DSA and CBC requirements.

B. Performance Requirements:

1. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, in accordance with ASTM E119 by an independent testing agency. Construct assemblies to achieve the fire resistance ratings indicated on Drawings. conform with applicable GA or UL, or design number indicated in the Drawings.

2. Acoustical Rated Assemblies: Construct assemblies to achieve acoustic ratings indicated on Drawings, tested to ASTM E90 and classified in accordance with ASTM E413.

3. Design framing systems in accordance with AISI S220, except as otherwise shown or specified.

4. Deflection Limits for Partitions and Ceilings: Conform with CBC Table 1604A.3.

1.04 SUBMITTALS

A. Shop Drawings: Submit drawings showing framing, connection details, accessories and anchorage. Indicate location of assemblies and size and spacing of framing components. Show reinforcing channels, opening support framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

B. Product Data: Submit manufacturer's technical catalog data for each item proposed for installation.

C. Certifications of Studs and Tracks: Provide documentation that framing members are certified in accordance with product-certification program of the Certified Steel Stud Association (CSSA) or the Steel Framing Industry Association (SFIA).

D. Evaluation Reports:

1. Submit evaluation reports certified under an independent third-party inspection program administered by an agency accredited by the International Accreditation Service (IAS) to ICC-ES AC98 Inspection Agency Accreditation, from ICC-ES, or other qualified testing agency acceptable to the DSA.

2. Submit ICC-ES Research/Evaluation Reports for post-installed anchors.

1.05 QUALITY ASSURANCE

A. Comply with the AISI Specifications and Standards AISI S220.

B. Coordinate with related Work to provide blocking for items mounted on finished surfaces and to provide allowances for pipes and other items inside partitions and walls.

C. Code-Compliance Certification: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association (SFIA) or similar organization providing a verifiable code-compliance program.

D. Caulking, sealants, primers, adhesives, coatings and paints must be approved by the OWNER’s Office of Environmental Health and Safety (OEHS).

E. Manufacturers shall be members of the Steel Framing Industry Association (SFIA) or the Steel Stud Manufacturers Association (SSMA).

1.06 DELIVERY, STORAGE AND HANDLING

A. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling, as required by AISI S202. Do not store material directly on grade. Provide adequate support to prevent bowing of material prior to installation.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. ClarkDietrich.

B. Marino/Ware.

C. CEMCO.

D. The Steel Network.

E. Stockton Products.

F. United Metal Products.

G. Equal products by manufacturers members of the Steel Framing Industry Association (SFIA) or the Steel Stud Manufacturers Association (SSMA).

2.02 MATERIALS

A. Framing Members, General: Comply with AISI S220 for conditions indicated.

1. Metal framing members and accessories shall be cold formed to shape from corrosion resistant-steel conforming to requirements of AISI S220 and ASTM A653, 33 ksi minimum. 50 Ksi steel may be used if the holding ability of screws by the thinner materials is demonstrated.

B. Protective Coating: Metal framing members and accessories shall be zinc coated to ASTM A653 G60, hot dip galvanized. Galvannealed products are unacceptable.

2.03 STUDS AND TRACKS

A. Studs: Comply with AISI S220; SFIA, Intertek CCRR – 0224, SSMA, ICC-ES ER-3064P, C Stud type, punched web, except tracks and joists, C-shaped, sizes required to conform to details and scheduled wall thicknesses. Studs and tracks shall be rolled from new steel sheet and shall not be produced from re-rolled steel. Stud and track flanges shall not be less than 1 1/4-inch wide.

B. Stud and Track Gages:

1. Wall Framing and Furring for Plaster and Mortar Beds: Studs and tracks shall be 18-gage (43-mil, 0.0428-inch base-steel thickness) minimum, unless otherwise indicated.

2. Wall Framing and Furring for Gypsum Wallboard: Studs and tracks shall be 20-gage (30-mils, 0.0296-inch minimum base-steel thickness) 33 ksi unless otherwise indicated.

3. Studs 18-gage (43-mil, 0.0428 inch) and thicker shall conform to requirements of Section 05 4000 - Cold Formed Metal Framing.

4. Stud gages indicated on Drawings or specified are the minimum. Where required stud height, loads or deflection exceed code requirements or manufacturer's recommendations, provide heavier gage studs and/or decrease stud spacing as necessary to conform to code requirements.

C. Shaft Wall Framing Members: CH or CT studs and J runners, 20-gage (0.0329-inch, 33-mil) minimum for 2-1/2, 4 or 6-inch studs, conforming to AISI S220, fabricated of steel conforming to ASTM A653, hot-dip galvanized to G-60.

2.04 SLOTTED DEFLECTION TRACKS

A. Designed to accommodate vertical movement of the building's floor/ceiling or roof/ceiling deck, for non-rated and fire-rated applications. Hot-dip galvanized to G-60.

B. Track shall meet the movement and cycling requirements of ANSI/UL 2079 and shall be UL Classified for the fire-resistant ratings in head-of-wall fire-rated joint systems indicated in the Drawings.

C. Include related framing accessories and fasteners, for a complete assembly. System shall provide for minimum tested overall movement of 3/4" up and 3/4" down.

D. Track shall be provided in standard widths of 4 and 6 inches and in 18-gage (43-mil, 0.0428"), and 20-gage (33-mil, 0.0329") base steel thickness, as required by Project conditions and detailed.

E. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.05 CEILING SYSTEMS

A. Suspended and Framed Ceiling Systems shall support finished ceiling, light fixtures, air diffusers, and accessories, as required.

B. Framed Ceilings: Plaster and Gypsum Wallboard Ceilings: Ceiling joists shall conform to AISI S220, hot-dip galvanized coated steel, C-shaped, unpunched, 20-gage (30-mil, 0.0296" base-steel thickness) minimum, unless noted otherwise.

C. Suspended Ceilings:

1. Main and Secondary Runners: Cold formed steel, galvanized, 3/4, 1-1/2 and 2 inch deep. 16-gage (54-mil, 0.0538-inch base steel thickness) and thicker, 50 ksi.

2. Furring members shall conform to AISI S220 and shall be fabricated from hot-dip galvanized cold-rolled steel 3/4 inch with 1/2" flanges hat channels. Minimum Base-Steel Thickness 30-gage (30-mils, 0.0296 inch).

3. Wires:

a. Class 1 zinc coated (galvanized) carbon steel conforming to ASTM A641. Wire shall be soft temper with a minimum ultimate tensile strength (F_u) of 70 kips per square inch (ksi).

b. Wire diameters shall be per the United States Steel Wire Gauge.

1) #12 diameter: 0.106-inch.

2) #10 diameter: 0.135-inch.

3) #9 diameter: 0.148-inch.

4) #8 diameter: 0.162-inch.

c. Maximum allowable load for ceiling wires shall be in conformance with DSA IR 25-1.

4. Compression Struts: Electrical Metallic Tubing (EMT) conforming to ANSI C80.3/UL 797 carbon steel with G90 galvanizing. EMT shall have minimum yield strength (F_y) of 30 kips per square inch (ksi) and minimum ultimate strength (F_u) of 48 kips per square inch (ksi).

D. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of galvanized G90 main beams and cross-furring members that interlock. System shall include hanger wires and vertical splay bracing, as specified above, and shall be horizontally restraint.

2.06 CONNECTIONS

A. Steel-To-Concrete Connections:

1. Post-Installed Concrete Anchors: Adhesive or expansion anchors fabricated from corrosion-resistant materials. Post-installed anchors shall have a current evaluation report acceptable to the DSA in accordance with IR A-5, Acceptance of Products, Materials and Evaluation Reports.

2. Power-Actuated Fasteners: Fabricated from corrosion-resistant materials with allowable load capacities in accordance with ICC-ES AC 70.

B. Steel-To-Steel Connections:

1. Screws: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping steel screws of the type and size indicated. Provide low-profile head beneath sheathing and manufacturer's standard elsewhere. Electroplated zinc coating per ASTM F1941.

2.07 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Framing Accessories: Provide standard related accessories including cold-rolled furring channels, resilient furring channels, furring brackets, Z-shaped furring, hat-

shaped channels, clips, bridging, web stiffeners, and similar items, of same manufacture as each type of stud specified, and as required for a complete installation.

B. Backing: Provide sections of studs and tracks welded or fastened to stud flanges or manufacturer made products specifically for this purpose.

C. Closed-cell neoprene foam, ¼-inch thick, selected from manufacturer's standard widths to match width of bottom track on concrete slab or foundation.

D. Plastic grommets for stud webs as recommended by stud manufacturer, to protect electrical wires and plumbing piping. Prevent metal-to-metal contact between wiring/piping and studs.

E. Acoustical Sealant: As specified in Section 07 9200.

F. Dry mineral wool and sealant system shall be as specified in Section 07 8413, Penetration Firestopping.

G. Refer to Section 05 5000, Metal Fabrications, for miscellaneous steel shapes, masonry shelf angles, and connections used with metal framing.

H. Isolation Strips: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8-inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine supporting and abutting substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that overhead or concealed Work is completed, tested, inspected, and finished as required before starting Work of this section.

C. Proceed with installation after unsatisfactory conditions have been corrected.

3.02 COORDINATION WITH CEMENTITIOUS FIREPROOFING

A. Before cementitious fireproofing is applied, attach offset anchor plates, z-furring members, or ceiling runners to surfaces indicated to receive cementitious fireproofing. Where offset anchor plates are required, provide continuous plates fastened to building structure.

B. After cementitious fireproofing is applied, remove material only to the extent necessary for installation of steel framing. Do not reduce thickness of cementitious fireproofing below that required for the fire-resistance ratings indicated. Protect adjacent cementitious fireproofing from damage. Repair or replace cementitious fireproofing as required to attain the required fire-resistance rating.

3.03 INSTALLATION OF WALLS AND PARTITIONS

A. Install sill sealer gasket at the underside of wall bottom tracks. For sound insulated partitions embed floor runner tracks in two beads of acoustical sealant or two runs of compressible tape seal.

B. Install metal framing in accordance with ASTM C754 and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install continuous tracks sized to match studs, aligning tracks accurately and securely anchor to supporting structure.

D. Install steel framing and accessories plumb, square, and true to line, and with connections securely fastened. Cut framing members by sawing or shearing; do not torch cut.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as indicated in the drawings. Provide 4 screws per stud.

G. Install horizontal bridging in wall studs, spaced vertically in rows indicated on the Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-formed steel channel, welded or mechanically fastened to webs of punched studs.

2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

3. Proprietary bridging bars installed in accordance with manufacturer's written instructions.

H. Top Bridging for Single Deflection Track: Install row of horizontal bridging 12 inches of single deflection track.

I. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

J. Sound insulated walls and partitions: Where wall ends abut concrete, masonry, or steel set end studs in two beads of acoustical sealant or two tape seals and secure at 4-foot centers vertically.

K. Tolerances: Install walls and partitions on straight lines, plumb, free of twists or other defects, and contacting a 10-foot straightedge for its entire length at any location within a 1/8-inch tolerance. Install horizontal framing level within a tolerance of 1/8-inch in 12-feet in any direction.

L. Where studs are installed directly against mullions, exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

3.04 CONNECTIONS TO METAL DECKING

A. Provide pre-molded neoprene filler strips matching flute profile for non-fire-rated walls and partitions covered on one or both sides up to metal decking.

B. The top runner track of fire-rated partitions shall be a minimum of 20 gage (30 mils) and fastened to metal deck with required fasteners at spacing required for fire rating, but in no case over 16 inches on center. Neither wallboard nor metal studs shall be fastened to top runner to allow for slab deflection. Areas above runner shall be friction fit with a minimum depth of 2 1/2-inch of 4-pounds per cubic foot mineral wool insulation. A minimum of ½-inch of firestopping compound shall be installed to each side of mineral wool insulation for 1-hour system, and 1-inch of firestopping for a 2-hour system. Install required special tracks, angles, fasteners and strips of gypsum wallboard as required to achieve required fire resistance rating.

C. Proprietary fire-rated top tracks shall be installed in accordance with manufacturer's recommendations and fire rating approval requirements.

3.05 INSTALLATION OF JOIST FRAMING

D. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Drawings. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

E. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.

1. Install joists over supporting frame with a minimum end bearing of 1-1/2-inches.

2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections.

F. Space joists not more than 2-inches from abutting walls, and as follows: Space joists 16 inches or as indicated on the Drawings.

G. Install bridging at intervals indicated o the on Drawings. Fasten bridging at each joist intersection.

H. Frame openings with built-up joist headers, consisting of joist and joist track or another combination of connected joists as indicated on the Drawings.

I. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.06 INSTALLATION OF SUSPENDED CEILINGS

A. Gypsum Wallboard Ceiling Suspension and Framing: Suspended ceiling system framing shall be installed in accordance with ASTM C754.

B. Hangers shall be spaced not more than 48 inches along runner channels and 36 inches in other direction or 42-inches in both directions unless otherwise indicated. Locations of hanger wires shall be coordinated with other Work. Hangers at ends of runner channels shall be located not more than 6 inches from walls. Hanger wire shall be fastened to structural elements with required fasteners. Sags or twists, which develop in suspended system, shall be adjusted. Damaged or faulty parts shall be replaced. Hanger wire shall be wrapped twice around runner channel, drawn up taut, and wrapped twice around itself.

C. Main Runners: Hanger wires shall be double strand saddle-tied to runner channels and ends of hanger wire shall be twisted three times around itself. Main runners shall be located to within 6 inches of parallel wall to support ends of cross furring. Main runners shall not come in contact with abutting masonry or concrete walls. Where main runners are spliced, ends shall be overlapped 12 inches with flanges of channels interlocked and shall be securely tied at each end of splice with wire looped twice around channels.

D. Furring channels shall be fastened to runner channels and to structural supports at each crossing with tie wire, hairpin clips, or required fastenings. Furring channels shall be located within 2-inches of parallel walls and beams and shall be cut 1/2-inch short of abutting walls. Securely saddle-tie furring channels to runner channels at each crossing with 16-gage (0.0538-inch diameter) tie wire twisted up taut, and with wings left uncut and bent back.

E. Ceiling Openings: Support members shall be provided as required at ceiling openings for access panels, recessed light fixtures, and air supply or exhaust. Support members shall be not less than 1 1/2-inch main runner channels and vertically installed suspension wires or straps shall be located to provide at least minimum support specified for furring and wallboard attachment. Intermediate structural members not a part of structural system, shall be provided for attachment or suspension of support members.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Install hangers as indicated on Paragraph 3.06.B. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track. Install control joints and splay wires and compression struts as indicated on paragraphs below. Light fixtures and air diffusers shall be supported directly from suspended ceiling runners. Wires shall be provided at required locations to support weight of recessed or surface mounted light fixtures and air diffusers.

G. Control Joints: Ceiling control joints for expansion and contraction shall be located where indicated in the Drawings. A control joint or intermediate blocking shall be installed where ceiling framing members change direction.

1. Interior Ceilings with Perimeter Relief: Control joints shall be installed so linear dimensions between control joints shall not exceed 50 feet in either direction or more than 2,500 square feet in area.

2. Interior Ceilings without Perimeter Relief: Control joints shall be installed so linear dimensions between control joints shall not exceed 30 feet in either direction nor more than 900 square feet in area.

H. Splay Wires and Compression Struts: Install as detailed and as required to prevent upward and sideward motion under seismic conditions, as required by code.

I. Suspension Under Ducts: For hangers spaced at 4 to 5 ½-foot centers, provide 6-gage (0.192-inch diameter) hanger wires with minimum 2-inch runner channels spaced at maximum 48-inch centers. For greater spans, design system for live load of l0-pounds per square foot of area plus dead load and provide a detail in Shop Drawings.

J. Furring: Provide framing for horizontal furring as shown or required. Conform to above requirements as applicable.

3.07 CLEANING

A. Remove debris, rubbish, and waste material and legally dispose of off Project site.

3.08 PROTECTION

A. Protect Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 2900

GYPSUM BOARD

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Gypsum board wall and ceiling systems.
2. Gypsum Liner.
3. Cement Tile Backer Board.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 05 4100 - Structural Metal Stud Framing.
3. Section 06 1000 - Rough Carpentry.
4. Section 07 9200 - Joint Sealants.
5. Section 09 2216 - Non-Structural Metal Framing.
6. 09 9000 Painting Coating.

1.02 PROJECT REQUIREMENTS

A. Design Requirements: Provide systems capable of resisting deflection as required by CBC and authorities having jurisdiction.

B. Regulatory Requirements: Comply with CBC requirements for design and installation.

1.03 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating complete suspension system including connections, anchorage, and trim features.

B. Material Samples: Submit 18 inch by 18 inch Samples of the texture coat of gypsum board panels with edges taped.

C. Product Data: Submit manufacturer's catalog data for each product proposed for installation.

1.04 QUALITY ASSURANCE

A. Comply with following as a minimum requirement:

1. ASTM C475 – Standard Specification for Joint Compound and Joint Tape for finishing Gypsum Board.

2. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.

3. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.

4. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

5. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

6. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.

7. ASTM C1396 - Standard Specification for Gypsum Board.

8. ASTM C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

9. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

10. Underwriters Laboratories (ULI) requirements and listings for fire-rated materials and products classification.

11. GA-214 - Gypsum board finish shall conform to requirements of GA 214, Application and Finishing of Gypsum Panel Products, published by the Gypsum Association, and as specified herein.

12. GA-216 – Application and Finishing of Gypsum Panel Products.

13. GA 600 - Gypsum board shall conform to requirements of GA 600 Fire Resistance Design Manual, published by the Gypsum Association.

14. American National Standards for the Installation of Ceramic Tile.

15. ANSI A118.11 – Test Methods and Specification for Cementitious Backer Units.

16. The Interior Guide, published by the Wall and Ceiling Conference (WWC).

B. Qualifications: Installer shall have a minimum 5 years experience in installing and finishing gypsum board.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, factory sealed packages, containers or bundles bearing brand name and name of manufacturer.

B. Materials shall be kept dry. Gypsum board shall be neatly stacked flat; avoid sagging and damage to edges, ends, and surfaces.

C. Fire-rated materials shall have fire classifications numbers attached and legible.

D. Provide all means necessary to protect gypsum board systems before, during, and after installation.

E. Gypsum board showing any evidence of water damage shall not be installed. Gypsum board showing evidence of water damage after installation shall be removed and replaced.

1.06 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTMC840, GA 216 requirements or gypsum board manufacturer's written instructions, whichever is more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet moisture damaged and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Georgia-Pacific.

B. National Gypsum Co.

C. U.S. Gypsum Co.

D. Or equal.

2.02 MATERIALS

A. Gypsum Board Type X (fire-resistant) or Type C or Type ULIX as required by fire rated design and acoustic requirements: 5/8 inch thick, 4-foot wide and up to 16-foot long conforming to ASTM C1396 with long edges tapered.

B. Impact Resistant Gypsum Board, Type X (fire-resistant): 5/8 inch thick or Type C as required by fire rated design and acoustic requirements, 4-foot wide and up to 16-foot long complying with the following:

1. Fire resistant rated gypsum core with additives to enhance impact resistance, faced with moisture and mold resistant paper and reinforcing fiber mesh. Comply with ASTM C1629 level 3 hard body impact resistance.

C. Mold and Moisture Resistant Gypsum Board, Type X (fire-resistant): (Use at elevator shaft interior), 5/8 inch thick 4-foot wide, up to 16-foot long conforming to ASTM C1396 with long edges tapered.

1. Resistance to Mold Growth: Minimum score of "10" when tested in accordance to ASTM D3273 and evaluated in accordance with ASTM D3274.

D. Gypsum Liner, Type X (fire-resistant): 1 inch thick 24-inch wide, up to 14-foot long, conforming to ASTM C1396 or C1658.

1. Resistance to Mold Growth: Minimum score of "10" when tested in accordance to ASTM D3273.

E. Glass Matt Gypsum Tile Backer: Fully embedded glass mat gypsum tile backer meeting the requirements of ASTM C 1178.

1. Type and Thickness: Type X, 5/8 inch and as otherwise required to meet fire rating for specific element.

2. Flame spread: ASTM E 84: Class A.

3. Smoke developed: ASTM E 84: Class A.

4. Standard Size: 4 feet by 8 feet.

5. Glass-Fiber Mesh Tape: Alkali-resistant self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch.

2.03 ACCESSORIES

A. Metal Trim: Paper-faced metal drywall beads and trim meeting ASTM C1047, as manufactured by USG/Beadex, or equal. Trim units shall be of size and type to fit gypsum board construction and shall include corner beads, casings, edge trim and other shapes indicated and required. Provide 30 year warranty against edge cracking.

B. Joint Compound for gypsum board products: meeting the following requirements:

1. Shall conform to ASTM C475.

2. In areas subject to moisture after installation such as bathrooms and locker areas use setting type joint compound.

3. Interior areas not subject to moisture after installation use drying Type Joint compound.

C. Joint Tapes for gypsum boards: Shall conform to ASTM C475.

D. Joint mortar and Tape for Cement board: Meet ANSI 118.4.

E. Finishing Materials: Texture coat finish material shall be manufactured by U.S. Gypsum, Hamilton, Murlux, Parex, Rapid Set-Cement, Eisenwall, Mortar Mix, Stucco Mix, Stucco Patch, One Pass, Westpac or equal.

F. Acoustical Sealant: Non-hardening, non-shrinking, for use in conjunction with gypsum board, as recommended by Board Manufacturer and conforming to ASTM C919. Sealant shall maintain fire and sound rating assembly.

G. Fasteners:

1. Self-drilling, bugle-head drywall screws; in conformance to ASTM C1002. No. 6 Type S or S12, 1 5/8-inch long for metal framing,

2. Wood framing: Screws: Type W 1 5/8-inch minimum length for single-layer panels. Screws shall be furnished with a corrosion-resistant treatment.

3. Adhesive: as recommended by board manufacturer and in compliance to ASTM C557.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Metal Trim:

1. Provide corner beads at outside corners and angles, metal casing where gypsum board terminates at uncased openings, metal edge trim where board edges abut horizontal and vertical surfaces of other construction.

2. Install trim in accordance with manufacturer's directions with appropriate joint compound. Install trim in longest practical pieces.

B. Gypsum Board:

1. Install gypsum board in conformance with ASTM C840, fire rated design, and sound rating.

2. Gypsum board shall be cut by scoring and breaking or by sawing, working from face side. Where board meets projecting surfaces it shall be scribed and neatly cut. Unless conditions require otherwise, gypsum board shall be installed first to ceilings, then to walls. End joints shall occur over a support. Install panels of maximum practical length so a minimum number of end joints occur.

3. End joints shall be staggered and joints on opposite sides of a partition shall be arranged to occur on different studs. Joint layout at openings shall be installed so no end joints will align with edges of openings.

4. Except where specified otherwise, fasteners shall be spaced not less than 3/8 inch from edges and ends of gypsum board. Do not stagger fasteners at adjoining edges and ends.

5. Install gypsum board vertically or horizontal as permitted by specific UL Design at walls. Fasten board with screws spaced not to exceed 8 inches on centers around perimeter of boards and 8 inches on centers on intermediate studs. Space screws at 8 inches on centers along top and bottom runners. Screws shall be driven to provide screwhead penetration just below gypsum board surface without breaking surface paper.

6. Install gypsum board to ceiling framing with long dimension at right angles to furring channels, or wood framing members, and fasten with specified screws or nails spaced 6 inches to 7 inches on centers across board. Screws or nails shall be not less than 1/2 inch from side joints and 3/8 inch from butt end joints. Abutting end joints shall occur over furring channels and end joints of boards shall be staggered. Support cutouts or openings in ceilings with furring channels.

7. Install access doors, furnished under another section, in correct location, plumb, or level, flush with adjacent construction, and securely fastened to framing.

C. Cement Board Backer System:

1. In shower areas, install water barrier in shingle-like manner to prevent water infiltration into stud cavity. Pre-cut all board to required sizes and make necessary cut-outs.

2. Install in accordance with UL Design and SA-932. Install tile backer board plumb and flat. Shim behind board as required.

3. Fasten to steel studs spaced max. 16" o.c. and bottom runners with fasteners spaced 8" o.c. maximum with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Studs shall be not less than 20 gage.

3.02 TOLERANCES

A. System shall appear smooth and monolithic with no exposed joints.

3.03 JOINT TREATMENT AND FINISHING

*At completion of specified taping and finishing, install one coat of drywall primer as specified hereafter

B. Levels: Install joint compound, tape, and finishing compound on joints in wall gypsum board as required for specified levels of finish.

C. Levels 2 through 5:

1. Install joint compound and finishing compound over screw heads. Treat all inside corners with joint compound, tape, and finishing compound. Treat outside corners with corner beads and finishing compound.

2. Provide metal casing beads at all edges of gypsum board, which abut ceiling, wall, or column finish, and elsewhere as required, such as openings, offsets, etc. Install all exposed joints, trims, and attachments non-apparent following

installation of paint or other finishes. If joints and fasteners are visibly apparent, correct defects as required.

3. All cut edges and openings around pipes and fixtures shall be sealed with a water-resistant flexible sealant.

4. When entire installation is completed, correct and repair broken, dented, scratched or damaged gypsum board before installation of finish materials by other trades.

D. Levels 3 and 4: Install one coat of high solids tinted topcoat primer over entire surface, Westpac Prep Coat, Tuff Hide Primer, and Hamilton Smooth Coat.

E. Level 5: Apply a skim coat over entire surface Westpac topping, USG topping, and Hamilton topping.

3.04 REQUIRED LEVELS OF FINISH

A. Finishes shall conform to GA 214

B. Unless otherwise indicated or specified, levels of finish required shall be as follows:

1. Level 1: Plenum areas above ceilings, insides of shafts, and other concealed areas. Taping to be as required for fire rated assemblies.

2. Level 2: Water-resistant gypsum board backing for high moisture areas to be covered with a water resistant surface other than tile, vinyl or paint, i.e stainless steel cladding etc.

3. Level 3: Backing for vinyl wall covering and adhered acoustic tile. Also, provide where textured finish is indicated.

4. Level 4: Exposed painted gypsum board in classrooms, utility rooms, and similar spaces not requiring Level 5 finish. To be painted per Section 09 9000, Painting and Coating, with a paint sheen shall not be greater than a “flat” finish.

5. Level 5: Exposed, painted gypsum board in offices and corridors. To be painted per Section 09 9000, Painting and Coating, with a “non-flat paint” - a paint material specifically manufactured to produce greater than 10 gloss units (GU) at an 60^{o} and greater than 35 gloss units (GU) at an 85^{o} angle when measured using a gloss meter.

3.05 TEXTURE COAT

A. Spray install texture coat to interior gypsum board surfaces where indicated on Drawings.

B. Texture coat shall provide a uniform splatter pattern finish with an 80 (100) percent minimum coverage of the entire surface area.

C. Provide protection from spray for interior surfaces of electrical boxes and wiring.

3.06 CLEAN-UP

A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

3.07 PROTECTION

A. Protect Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 5113

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Lay-in acoustical ceiling systems and metal suspension systems.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 09 2216 - Non-Structural Metal Framing.
3. Section 09 2900 - Gypsum Board.
4. Section 09 5115 - Vinyl-Faced Acoustical Ceilings.
5. Section 11 5215 – Video/Multimedia Projector Mounting Plate.
6. Division 23 - HVAC.
7. Division 26 - Electrical.

1.02 REFERENCES

A. ASTM International (ASTM):

1. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
5. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E580 – Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
8. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

9. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.

10. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

B. American Society of Civil Engineers (ASCE):

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures, as amended by CBC 1615A.1.16.

1.03 QUALITY ASSURANCE

A. Ceiling systems shall consist of lay-in acoustical ceiling panels by a single manufacturer and suspension systems by a single manufacturer for the entire project.

B. Qualifications of Installer: Minimum five years experience in installing acoustical ceiling systems of the types specified.

C. Design Criteria:

1. Deflection of finished surface to 1/360 of span or less.

2. 1/8-inch maximum permissible variation from true plane measured from 10-foot straightedge placed on surface of finished acoustical fiber units.

D. Requirements of Regulatory Agencies:

1. Conform to CBC requirements and UL - Tunnel Test for Fire Hazard Classification of Building Materials.

2. CISCA: Acoustical Ceilings Use and Practice.

3. Division of the State Architect: Comply with requirements of IR 25-2.

E. Pre-Installation Meeting: Conform to requirements of Section 01 3119 Project Meetings, Article Pre-Installation Conferences.

1.04 SUBMITTALS

A. Samples:

1. Lay-in panels of each specified type, 6-inch by 6-inch minimum size.

2. Suspension System: 12-inch-long samples of suspension system members, connections, moldings and wall angles, for each color specified.

B. Shop Drawings:

1. Indicate complete plan layouts and installation details.

2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.

C. Product Data:

1. Suspension System for Lay-in Ceiling: Printed data for suspension system components, including load tests, indicating conformance to specified tests and standards.

2. Acoustical units: Printed data indicating conformance to specified tests and standards.

D. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than 8 of each specified size, style and color.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project site in original sealed packages.

B. Storage: Store materials in building area where they will be installed, in original package. Keep clean and free from damage due to water or deteriorating elements.

C. Handle in a manner to prevent damage during storage and installation.

1.06 PROJECT CONDITIONS

A. Installation of acoustical ceiling system shall not begin until the building is enclosed, permanent heating and cooling is in operation, and residual moisture from plaster and concrete work has dissipated. Building areas to receive ceilings shall be free of construction dust and debris.

B. Environmental Requirements: Maintain temperature in space at 55 degrees F or above for 24 hours before, during, and after installation of materials.

C. Scheduling:

1. Before concealing Work of other sections, verify required tests and inspections have been completed.

2. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and penetrations with related Work section.

1.07 WARRANTY

A. Manufacturer shall provide a 10-year material warranty.

B. Installer shall provide a two-year fabrication and installation warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. USG Corporation.

B. Armstrong World Industries.

C. CertainTeed / Saint-Gobain.

D. Equal.

2.02 SUSPENSION SYSTEM

A. Metal suspension system for acoustical lay-in tile shall be hot-dipped galvanized steel conforming to ASTM A653. Main beams and cross tees shall be double-web steel construction with exposed flange design, with factory punched cross tee slots, hanger holes and integral couplings.

B. Metal suspension system for acoustical lay-in tile shall conform with ASTM C635, C636 and E580 and section 13.5.6 of ASCE 7, as amended by CBC Section 1615A.1.16, for installation in high seismic areas.

C. Structural classification of suspension systems shall be heavy-duty in conformance to ASTM C635.

D. Vertical Strut: USG Donn Compression Post, or equal, or as indicated; types and designs complying with requirements of authorities having jurisdiction and seismic Zones D, E and F requirements. Provide base attachment clip for connection of vertical strut to main beams.

E. Wall Molding: Fabricated from galvanized steel with 2-inch horizontal leg and hemmed edges, same finish as main and cross tees.

F. Spacer/Stabilizer Bars: Provide for tying together the ends of main runners and cross tees that are not attached to wall molding.

G. Hanger Wire: 0.106 inch diameter (0.144 inch diameter for pendant fixtures), galvanized soft annealed mild steel wire as defined in ASTM A641, Class 1 coating.

H. Provide attachment devices and any other required accessories for a complete suspended ceiling system installation.

2.03 ACOUSTICAL CEILING PANELS

A. Acoustical ceiling panels shall be class A in accordance with ASTM E1264.

B. Acoustical panels shall meet the following surface-burning characteristics when tested in accordance with ASTM E84 for Class A materials:

1. Maximum Flame Spread: 25.

2. Maximum Smoke Developed: 50.

C. Mold and Mildew Resistance: Panels and faces shall be treated with a biocide paint additive or an antimicrobial solution to inhibit mold and mildew.

2.04 CEILING TYPES

A. ACT 1 - Classrooms:

1. Acoustical Ceiling Panels:

a. Panel Name: Armstrong Fine Fissured High NRC 1811, USG Radar Climaplus HiNRC 22311, CertainTeed / Saint-Gobain Fine Fissured HHF 497 HNRC, or equal.

b. Panel Size: 2-foot by 4-foot.

c. Panel Thickness: 3/4 inch.

d. Edge Detail: Lay-in.

e. Light Reflectance: 0.83 minimum, complying with ASTM E1477.

f. CAC: Minimum 35 - 39, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.

h. Color: White.

i. Recycled Content: Minimum 37 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

B. ACT 2 - Administration:

1. Acoustical Ceiling Panels:

a. Panel Name: Armstrong Ultima 1912, USG Mars ClimaPlus 86985, CertainTeed / Saint-Gobain Symphony M #1222BF-OVT-1, or equal.

b. Panel Size: 2-foot by 2-foot.

c. Panel Thickness: 3/4 inch.

d. Edge Detail: Beveled tegular.

e. Light Reflectance: 0.89 minimum, in accordance with ASTM E1477.

f. CAC: Minimum 35, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.

h. Color: White.

i. Recycled Content: 74 percent minimum.

2. Suspension System:

a. Suspension System Name: Silhouette XL by Armstrong, Fineline by USG, 4500 Ultraline Series by Chicago Metallic Corporation, or equal.

b. Color: White.

C. ACT 3 - Cafeteria:

1. Acoustical Ceiling Panel:

a. Panel Name: Armstrong Optima Open Plan 3250, USG Halcyon #98223, CertainTeed / Saint-Gobain Symphony F 1342B-OVT-1, or equal.

b. Panel Size: 2-foot by 2-foot.

c. Panel Thickness: 1 inch.

d. Edge Detail: Tegular.

e. Light Reflectance: 0.88 minimum, complying with ASTM E1477.

f. NRC: Minimum 0.95, UL Classified, complying with ASTM C423.

g. Color: White.

h. Recycled Content: Minimum 28 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

D. ACT 4 – Other areas:

1. Acoustical Ceiling Panel:

a. Panel Name: Armstrong Fine Fissured 1729, USG Radar Climaplus 2410, CertainTeed / Saint-Gobain Hytone Fine Fissured HHF 197, or equal.

b. Panel Size: 2-foot by 4-foot.

c. Panel Thickness: 5/8 inch.

d. Edge Detail: Lay-in.

e. Light Reflectance: 0.82 minimum, complying with ASTM E1477.

f. CAC: Minimum 35, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.55, UL Classified; complying with ASTM C423.

h. Color: White.

i. Recycled Content: Minimum 37 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

E. ACT 5 – Specialty Acoustic Spaces:

1. Acoustical Ceiling Panel:

a. Spaces with specialty acoustical requirements such as Music Classrooms, Multi-Purpose Room, shall be provided with the NRC and CAC performance requirements indicated on drawings.

b. Ceiling tiles in control rooms in Multi-Purpose Rooms and Auditoriums shall be black in color.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips or other supports and struts required to be installed by the Work of other trades that depend on the suspended ceiling system for support.

B. Coordinate related Work to ensure completion prior to installation of clips or fasteners.

C. Compare layouts with construction conditions. Tile shall be spaced symmetrically about the centerlines of the room or space and shall start with a tile or joint line as required to avoid narrow tiles at the finish edges unless indicated otherwise. Joints shall be tight with joint lines straight and aligned with the walls. Ceiling moldings shall be provided where tile abuts wall with matching caulking to eliminate any space.

3.02 INSTALLATION OF SUSPENSION SYSTEMS

A. General:

1. Install suspension system in accordance with ASTM C636 and ASTM E580.

2. System shall be complete; with joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.

3. Hanger Wires: 0.106 inch diameter minimum; larger sizes as indicated or required.

a. Fasten wires to panel points and structure above per most stringent requirements of fabricator and CBC and as indicated on Drawings.

b. Wires exceeding 1:6 out-of-plumb shall be braced with counter-sloping wires.

c. Maintain wires at least 6 inches from non-braced ducts, pipes, conduits, and other items.

d. Install wire along main runners at 4 feet on center. Terminal ends of each main runner and cross tee must be supported within 8 inches of each wall with a perimeter wire or within one-fourth (1/4) of the length of the end tee, whichever is least, for the perimeter of the ceiling area.

e. Where obstructions prevent direct suspension, provide trapezes or equivalent devices; 1 ½-inch minimum cold rolled channels back to back may be installed for spans to 6 feet maximum.

f. Wire shall be straight, without extraneous kinks or bend. Hanger wire connections must be capable of carrying a 200 - pound pull without stretching or shifting the suspension clip.

4. Bracing Wires to Resist Seismic Forces: 0.106 inch diameter minimum, larger sizes as indicated or required.

a. System for Bracing Ceilings: Lay-In Ceiling Systems: Install one four-wire set of sway-bracing wires and a vertical strut for each 144 square feet maximum of ceiling area. Locate wire-sets and struts at 12 feet maximum on center. At ceiling perimeters, wire-sets shall be installed within 6 feet of walls.

b. Install four-wire sets and struts within 2 inches of cross-runner intersection with main runner; space wires 90 degrees from each other.

c. Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.

d. Wires shall be tight, without causing ceiling to lift.

e. Fasten struts in accordance with CBC requirements.

f. Maintain wires at least 6 inches from non-braced ducts, pipes, conduit, and other items.

5. Provide additional wires, 0.106-inch diameter minimum, necessary to properly support suspension at electrical devices, air distribution devices, vertical soffits, and other concentrated loads.

6. Suspension:

a. Suspension members shall be fastened to two adjacent walls per ASTM 580; but shall be at least 3/4 inches minimum clear of other walls.

b. Any suspension members not fastened to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or stabilizer bar or 0.064-inch diameter taut tie wire.

c. Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross bracing necessary to securely support any surface mounted fixtures or other items.

7. Attachment of Wires:

a. To Metal Deck or Steel Framing Members: Install as required by current code.

b. To Suspension Members: Insert through holes in members or supporting clips.

c. Wires shall be fastened with three tight turns minimum for hanger wires and four tight turns minimum bracing wires. Turns shall be made in a 1 ½-inch maximum distance.

B. Suspension System for 2-foot by 4-foot Lay-in Acoustical Ceilings:

1. Main Runners: Install main runners 48 inches apart; 0.106-inch diameter hanger wires space 48 inches on center maximum along runners, and within 8 inches of ends.

2. Install wall moldings with fasteners to studs. Install corner caps at molding intersections.

3. Cross-Tees: Install between main runners in a repetitive pattern of 2-foot spacings.

4. Sub-Tees: Install at edges of penetrations.

3.03 INSTALLATION OF ACOUSTICAL PANELS

A. Install panels into suspension system. Partial panels shall be neatly cut and fitted to suspension and around penetrations and/or obstructions. Duplicate tegular edges at partial panels; cuts to be straight. Repaint cut tiles to match color or as directed by manufacturer for mylar facing at visually exposed conditions or as required by the ARCHITECT.

B. Penetrations through the ceilings for sprinkler heads and other similar devices that are not integgrally tied to the celing system in the lateral direction shall have a 2 inch oversized ring, sleeve or adapter through the celing tile to allow freee movement of one inch in horizontal directions. Alternateively per ASTM E580, a flexible sprinkler hose fitting that can accommodate one inch of celing movement shall be permitted to be used in lieu of the oversized ring, sleeve or adapter.

3.04 AIR DISTRIBUTION DEVICES

A. Refer to and coordinate with Division 23 - HVAC.

B. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 0.106-inch diameter minimum, to each device within 3 inches of device corners, to support their weight independent of the suspension system.

3.05 LIGHT FIXTURES

A. Refer to and coordinate with Division 26 - Electrical.

B. Fixtures weighing less than 56 pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 0.106-inch diameter minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.

C. Fixtures weighing 56 Pounds or more: Install fixtures into suspension system and fasten earthquake clips to suspension system members as required by the Drawings and/or code. Install not less than 4 taut 0.106-inch diameter wires capable of supporting four times the fixture load.

D. Support pendant-mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting two times the weight of the fixture. Brace the pendant-mounted light fixtures by either a bracing assembly at the ceiling penetration or below the ceiling to the walls, as indicated in the drawings.

3.06 CLEANING

A. General: After installation of acoustical material has been completed, clean surfaces of the material, removing any dirt or discolorations. Replace panels as required.

B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.

C. Remove and replace work that can not be succesfully cleaned and repaired to eliminate evidence of damage.

3.07 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose off of the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 5115

VINYL-FACED ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Vinyl-faced lay-in acoustical ceiling systems and metal suspension system.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 09 2216 - Non-Structural Metal Framing.
3. Section 09 2900 - Gypsum Board.
4. Section 09 5113 - Acoustical Panel Ceilings.
5. Division 23 - Mechanical.
6. Division 26 - Electrical.

1.02 REFERENCES

A. ASTM International (ASTM):

1. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
5. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E580 – Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
8. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
9. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.

10. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

B. American Society of Civil Engineers (ASCE):

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures, as amended by CBC 1615A.1.16.

1.03 QUALITY ASSURANCE

A. ACeiling systems shall consist of lay-in acoustical ceiling panels by a single manufacturer and suspension systems by a single manufacturer for the entire project.

B. Qualifications of Installer: Minimum five years experience in installing acoustical ceiling systems of the types specified.

C. Design Criteria:

1. Deflection of finished surface to 1/360 of span or less.

2. 1/8 inch maximum permissible variation from true plane measured from 10 foot straightedge placed on surface of finished acoustical fiber units.

D. Requirements of Regulatory Agencies:

1. Conform to CBC requirements and UL - Tunnel Test for Fire Hazard Classification of Building Materials.

2. CISCA: Acoustical Ceilings Use and Practice.

3. Division of the State Architect: Conply with requirements of IR 25-2.

E. Pre-Installation Meeting: Conform to requirements of Section 01 3119 Project Meetings, Article Pre-Installation Conferences.

1.04 SUBMITTALS

A. Samples:

1. Lay-in panels of each specified type, 6-inch by 6-inch minimum size.

2. Suspension System: 12-inch long samples of suspension system members, connections, moldings and wall angles.

B. Shop Drawings:

1. Indicate complete plan layouts and installation details.

2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.

C. Product Data:

1. Suspension System for Lay-in Ceiling: Printed data for suspension system components, including load tests, indicating conformance to specified tests and standards.

2. Vinyl-faced acoustical units: Printed data indicating conformance to specified tests and standards.

D. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than 8 of each specified size, style and color.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project site in original sealed packages.

B. Storage: Store materials in building area where they will be installed, in original package. Keep clean and free from damage due to water or deteriorating elements.

C. Handle in a manner to prevent damage during storage and installation.

1.06 PROJECT CONDITIONS

A. Installation of vinyl-faced acoustical ceiling system shall not begin until the building is enclosed, permanent heating and cooling is in operation, and residual moisture from plaster and concrete work has dissipated. Building areas to receive ceilings shall be free of construction dust and debris.

B. Environmental Requirements: Maintain temperature in space at 55 degrees F or above for 24 hours before, during, and after installation of materials.

C. Scheduling:

1. Before concealing Work of other sections, verify required tests and inspections have been completed.

2. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and penetrations with related Work section.

1.07 WARRANTY

A. Manufacturer shall provide a 10 year material warranty.

B. Installer shall provide a two year fabrication and installation warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. USG Corporation.

B. Armstrong World Industries.

C. CertainTeed Ceilings Corp. / Saint-Gobain.

D. Equal.

2.02 SUSPENSION SYSTEM

A. Metal suspension system for acoustical lay-in tile shall be hot-dipped galvanized steel conforming to ASTM A653. Main beams and cross tees shall be double-web steel construction with exposed flange design, with factory punched cross tee slots, hanger holes, integral couplings, capped with aluminum capping.

B. Metal suspension system for acoustical lay-in tile shall conform with ASTM C635, C636 and E580 and section 13.5.6 of ASCE 7, a amended by CBC Section 1615A.1.16, for installation in high seismic areas.

C. Structural classification of suspension systems shall be heavy-duty in conformance to ASTM C635.

D. Vertical Strut: USG Donn Compression Post, or equal, or as indicated; types and designs complying with requirements of authorities having jurisdiction and seismic Zones D, E and F requirements. Provide base attachment clip for connection of vertical strut to main beams.

E. Wall Molding: Fabricated from galvanized steel with 2-inch horizontal leg and hemmed edges, same finish as main and cross tees.

F. Spacer/Stabilizer Bars: Provide for tying together the ends of main runners and cross tees that are not attached to wall molding.

G. Hanger Wire: No. 0.106-inch diameter (0.144-inch diameter for pendant fixtures), galvanized soft annealed mild steel wire as defined in ASTM A641, Class 1 coating.

H. Provide attachment devices and any other required accessories for a complete suspended ceiling system installation.

2.03 VINYL-FACED ACOUSTICAL CEILING PANELS

A. Ceiling panels shall be class A in accordance to ASTM E1264.

B. Panels shall meet the following surface-burning characteristics when tested in accordance to ASTM E84 for Class A materials:

1. Maximum Flame Spread: 25.

2. Maximum Smoke Developed: 50.

C. Mold and Mildew Resistance: Panels and faces shall be treated with a biocide paint additive or an antimicrobial solution to inhibit mold and mildew.

2.04 CEILING TYPES

A. VF-ACT 1 - Kitchen:

1. Acoustical Ceiling Panels:

a. Panel Name: Armstrong Clean Room VL 870, USG Sheetrock Lay-In Ceiling Tile ClimaPlus Vinyl 3270, CertainTeed / Saint-Gobain. Vinylrock #1140-CRF-1, or equal.

b. Panel Size: 2-foot by 4-foot.

c. Panel Thickness: 1/2 inch minimum.

d. Edge Detail: Lay in.

e. Light Reflectance: 0.77 minimum, complying with ASTM E1477.

f. CAC: Minimum 40, UL Classified, complying with ASTM E1414.

g. Color: White.

h. Recycled Content: 25 percent minimum.

2. Suspension System:

a. Suspension System Name: Prelude Plus XL by Armstrong, Donn DXLA, 1280 Aluminum Cap System by Chicago Metallic Corporation, or equal.

b. Color: White.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips or other supports and struts required to be installed by the Work of other trades that depend on the suspended ceiling system for support.

B. Coordinate related Work to ensure completion prior to installation of clips or fasteners.

C. Compare layouts with construction conditions. Tile shall be spaced symmetrically about the centerlines of the room or space, and shall start with a tile or joint line as required to avoid narrow tiles at the finish edges unless indicated otherwise. Joints shall be tight with joint lines straight and aligned with the walls. Ceiling moldings shall be provided where tile abuts wall with matching caulking to eliminate any space.

3.02 INSTALLATION OF SUSPENSION SYSTEMS

A. General:

1. Install suspension system in accordance with ASTM C636 and ASTM E580.

2. System shall be complete; with joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.

3. Hanger Wires: 0.106-inch diameter minimum; larger sizes as indicated or required.

a. Fasten wires to panel points and structure above per most stringent requirements of fabricator and CBC and as indicated on Drawings.

b. Wires exceeding 1:6 out-of-plumb shall be braced with counter-sloping wires.

c. Maintain wires at least 6 inches from non-braced ducts, pipes, conduits, and other items.

d. Install wire along main runners at 4 feet on center. Terminal ends of each main runner and cross tee must be supported within 8 inches of each wall with a perimeter wire or within one-fourth (1/4) of the length of the end tee, whichever is least, for the perimeter of the ceiling area.

e. Where obstructions prevent direct suspension, provide trapezes or equivalent devices; 1 ½-inch minimum cold-rolled channels back to back may be installed for spans to 6 feet maximum.

f. Wire shall be straight, without extraneous kinks or bend. Hanger wire connections must be capable of carrying a 200 - pound pull without stretching or shifting the suspension clip.

4. Bracing Wires to Resist Seismic Forces: 0.106 inch diameter minimum, larger sizes as indicated or required.

a. System for Bracing Ceilings: Lay-In Ceiling Systems: Install one four-wire set of sway-bracing wires and a vertical strut for each 144 square feet maximum of ceiling area. Locate wire-sets and struts at 12 feet maximum on center. At ceiling perimeters, wire-sets shall be installed within 6 feet of walls.

b. Install four-wire sets and struts within 2 inches of cross-runner intersection with main runner; space wires 90 degrees from each other.

c. Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.

d. Wires shall be tight, without causing ceiling to lift.

e. Fasten struts in accordance with CBC requirements.

f. Maintain wires at least 6 inches from non-braced ducts, pipes, conduit, and other items.

5. Provide additional wires, 0.106-inch diameter minimum, necessary to properly support suspension at electrical devices, air distribution devices, vertical soffits, and other concentrated loads.

6. Suspension:

a. Suspension members shall be fastened to 2 adjacent walls per ASTM E580; but shall be at least 3/4 inches minimum clear of other walls.

b. Any suspension members not fastened to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or stabilizer bar or 0.064-inch diameter taut tie wire.

c. Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross-bracing necessary to securely support any surface mounted fixtures or other items.

7. Attachment of Wires:

a. To Metal Deck or Steel Framing Members: Install as required by current code.

b. To Suspension Members: Insert through holes in members or supporting clips.

c. Wires shall be fastened with three tight turns minimum for hanger wires and four tight turns minimum for bracing wires. Turns shall be made in a 1 ½-inch maximum distance.

B. Suspension System for 2-foot by 4-foot Lay-in Acoustical Ceilings:

1. Main Runners: Install main runners 48 inches apart; 0.106-inch diameter hanger wires space 48 inches on center maximum along runners, and within 8 inches of ends.

2. Install wall moldings with fasteners to studs. Install corner caps at molding intersections.

3. Cross-Tees: Install between main runners in a repetitive pattern of 2-foot spacings.

4. Sub-Tees: Install at edges of penetrations.

3.03 INSTALLATION OF VINYL-FACED ACOUSTICAL PANELS

A. Install panels into suspension system. Partial panels shall be neatly cut and fitted to suspension and around penetrations and/or obstructions. Duplicate tegular edges at partial panels; cuts to be straight. Repaint cut tiles to match color or as directed by manufacturer for mylar facing at visually exposed conditions or as required by the ARCHITECT.

B. Penetrations through the ceilings for sprinkler heads and other similar devices that are not integgrally tied to the celing system in the laeral direction shall have a 2-inch oversizzed ring, sleeve or adapter through the celing tile to allow freee movement of one inch in horizontal directions. Alternateively per ASTM E580, a flexible sprinkler hose fitting that can accommodate 1-inch of celing movement shall be permitted to be used in lieu of the oversized ring, sleeve or adapter.

3.04 AIR DISTRIBUTION DEVICES

A. Refer to and coordinate with Division 23 - HVAC.

B. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 0.104-inch diameter minimum, to each device within 3 inches of device corners, to support their weight independent of the suspension system.

3.05 LIGHT FIXTURES

A. Refer to and coordinate with Division 26 - Electrical.

B. Fixtures weighing less than 56 pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 0.106-inch diameter minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.

C. Fixtures weighing 56 Pounds or more: Install fixtures into suspension system and fasten earthquake clips to suspension system members as required by the Drawings and/or code. Install not less than four taut 0.106-inch diameter wires capable of supporting four times the fixture load.

3.06 CLEANING

A. General: After installation of acoustical material has been completed, clean surfaces of the material, removing any dirt or discolorations. Replace panels as required.

B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.

C. Remove and replace work that can not be succesfully cleaned and repaired to eliminate evidence of damage.

3.07 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose off of the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 6513

RUBBER BASE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Topset coved rubber base for installation with surface flooring.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 09 6516 - Resilient Sheet Flooring.
3. Section 09 6518 - Rubber Flooring and Stair Covering.
4. Section 09 6519 - Vinyl Composition Tile.
5. Section 09 6543 - Linoleum Flooring.
6. Section 09 6813 – Tile Carpet.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer’s published technical data describing materials, construction and recommended installation instructions. Submit technical data and installation instructions for each adhesive material.

B. Maintenance Instructions: Submit manufacturer’s recommendations for maintenance, care and cleaning of base.

C. Samples: Submit Samples of topset base in each available color. Following color selections, submit Samples, not less than 12 inches long of each selected color and type. Submit pint cans of each type adhesive.

D. Maintenance Materials: Before Substantial Completion, deliver at least 50 lineal feet and five outside corner units of each color of rubber base installed. Deliver the materials in unopened factory containers or in sealed cartons with labels identifying the contents, matching installed materials. Include unopened cans of adhesives adequate to install the maintenance materials.

1.03 QUALITY ASSURANCE

A. Qualifications of Installer: Minimum five years experience in successfully installing the same or similar flooring materials.

B. Comply with the following as a minimum requirement:

1. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.

2. ASTM F1861: Standard Specification for Resilient Wall Base.

3. Comply with current CHPS requirements, www.chps.net.

4. Chemically based products such as sealers, primers, fillers, adhesives, etc. must be approved by Owner's Office of Environmental Health and Safety (OEHS).

5. Each selected color and configuration shall be from same dye lot and color.

1.04 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in original unopened manufacturer's packaging clearly labeled with manufacturer's name. Store materials at room temperature, but not less than 70 degrees F, for a minimum of 48 hours before installation, unless otherwise indicated in manufacturer's printed instructions.

1.05 PROJECT CONDITIONS

A. Ventilation and Temperature: Verify areas that are to receive rubber base are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufactures for site installation conditions.

1.06 WARRANTY

A. Manufacturer shall provide a five year material warranty.

B. Installer shall provide a two year fabrication and installation warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Mannington/Burke Wall Base.

B. Roppe, Pinnacle Rubber Base.

C. Flexco Company, Wallflower Premium Rubber Wall Base.

D. Tarkett.

E. Equal.

2.02 MATERIALS

A. Rubber base: Conform to ASTM F1861; Group 1, solid (homogeneous); Type 1, TS, (thermoset) vulcanized rubber, Style B (coved), 4-inch high unless otherwise indicated, integral colors as selected, non-shrinking, 1/8 inch thick, with matching molded outside corners.

B. Base Adhesive: Water based, low odor type, as recommended by manufacturer of rubber base.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate the Work of this section with other sections to provide a level, smooth and clean finish surfaces to receive rubber base.

3.02 EXAMINATION

A. Field verify dimensions and other conditions affecting the Work of this section before commencing the Work of this section.

B. Before Work is started, examine surfaces that are to receive rubber base. Deficiencies shall be corrected before starting the Work of this section.

3.03 PREPARATION

A. Do not start preparation until adjacent concrete floor slabs are at least 90 days old and finish flooring is installed.

B. Install rubber base when ambient temperature is 70 degrees F. or higher.

3.04 INSTALLATION

A. Install topset base at:

1. Hard floors, including resilient flooring, concrete and wood, carpet tile and other soft floors.

2. Along cabinetry base and where flooring extends into open cabinets.

B. Install all wall base with pre-molded outside corners. Clean and prep existing wall and apply adhesive to the wall or back of base. Ensure that not less than 18-inch-long filler or end pieces are not installed. Roll base to ensure that the top of the bass installed is tight against the wall and toe is tight against the floor, all end joints to be tight with no gaps. Install matching factory pre-molded outside corners at all offsets. Should pre-molded outside corners become unavailable and confirmed, corners are to be wrapped tight by slightly gouging the back of the Base and apply adhesive at gauge. Wrap base

around the corner, Push base down at the corner to form a consistent toe, ensuring that it is snug to the floor on both sides of the corner, All Inside corners shall be scribed fit tight with no gaps at the top or bottom of the base. Wrapped inside corners are not acceptable.

C. Use of adhesive gun is prohibited. Apply adhesive directly to substrate using the appropriate notched trowel or spreader according to manufacturer's instructions. Maintain 1/8 inch gap from top of base to prevent adhesive oozing onto adjacent surfaces.

D. Base and outside corners shall be rolled with a seam roller before adhesive sets.

3.05 CLEANING

A. Maintain surfaces of base clean as installation progresses. Clean rubber base when sufficiently seated and remove foreign substances.

B. Clean adjacent surfaces of adhesive or other defacement. Replace damaged and/or defective Work to the specified condition.

3.06 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 6813

TILE CARPETING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Tile carpeting.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 09 0561 - Moisture Testing for Flooring Installation.

3. Section 09 6513 - Rubber Base.

1.02 SUBMITTALS

A. Shop Drawings: Submit dimensioned layout of carpet tile and details for binder bars.

B. Samples:

1. Submit minimum three labeled carpet tile actual size with proper backing. Carpet style and color as selected by the Owner.

2. Trim and accessories: Submit 12-inch long Samples of each type trim proposed for the Work.

C. Product Data: Submit the following:

1. Carpet tile manufacturer's published technical data fully describing carpet materials, construction, and recommended installation directions.

2. Technical data and installation instructions for each adhesive and sealer material.

3. Carpet tile manufacturer's published instructions for maintenance, care, cleaning and repair of carpet.

4. MSDS on Manufacturers recommended adhesives and primers.

D. Certificate:

1. Submit a certificate from carpet tile manufacturer that materials supplied comply with fire hazard resistance standards specified.

2. Submit a manufacturer certification that the installer is approved by the manufacture to install the specified product.

E. Installer's Experience Qualifications: Submit list of not less than five projects with similar scope of work, extending over period of not less than five years, indicating installer's experience record.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. Manufacturer's installation instructions

2. Materials shall comply with CBC Chapter 11B and ADAAG requirements.

3. Comply with current CHPS requirements for low emitting materials, www.chps.net.

4. Chemically based products such as sealers, primers, fillers, adhesives, etc. must be approved by owner's office of the Environmental Health and Safety (OEHS).

5. Carpet tile must be free of Anti-Microbial Protection.

6. Comply with ASTM F1869 for moisture testing.

B. Requirements of Regulatory Agencies: Carpet tile shall meet requirements of federal, state and local regulatory agencies for flammability, static control, or other properties as specified with testing documentation from the manufacturer by a third party laboratory.

C. Carpet Tile Installation: Comply with CRI 104 - Standard for Installation of Textile Floor Covering Materials.

D. Each color of carpet tile shall be of the same dye lot.

E. Qualifications of Installer: Minimum five years experience in successfully installing the same or similar flooring materials.

F. Pre-Installation and Progress meetings: Prior to start of work of this section and after approval of submittals, schedule an on site Pre-Installation and progress meetings between Contractor, Supervising Installer, OAR, Project Inspector and representatives of the material manufacturer to review construction, drawings and installation procedures in accordance with the requirements of this specification.

1.04 DELIVERY, STORAGE AND HANDLING

A. Full cartons of carpet tile shall be packaged and identified by the flooring manufacturer. Distributor, dealer, or vendor cutting, re-packaging, and re-labeling is not permitted.

B. Store material at least 48 hours at room temperature prior to installation and in accordance to manufacturer's instructions.

C. Deliver fire-rated materials with testing agency labels and required fire classification numbers attached and legible.

1.05 JOB CONDITIONS

A. Ventilation and Temperature: Verify areas to be carpeted are ventilated to remove any off gassing from installation materials, and areas are within temperature range recommended by the various material manufacturers for Project site installation conditions. The temperature of a concrete slab must be stabilized above 65 degrees both 12 hours prior to and after the installation. The following environmental conditions inside the building are critical for proper installation. Temperature must be between 65 degrees F and 95 degrees F and the humidity between 10 percent and 65 percent for at least 72 hours before and 72 hours after installation. In addition, any adhesives and primers should be stored under these conditions for a minimum of 24 hours prior to installation.

B. Protection: Prohibit traffic on carpet for at least 12 hours after installation. Cover carpet with heavy non-staining Kraft paper in areas where the Work of other trades is to be performed and traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

1.06 WARRANTY

A. Contractor shall provide a two year installation warranty.

B. Manufacturer shall provide a 30 year material warranty as described below:

1. Delamination Warranty: Carpet tile will not delaminate for a minimum of 30 years from the date of installation.

2. Zippering Warranty: Carpet tile will not zipper or develop continuous pile yarn runners in the body of the carpet for a minimum of 30 years from the date of Substantial Completion.

3. Edge Ravel: Carpet tile will not have continuous pile yarn coming out at seams for a minimum of 30 years from the date of Substantial Completion.

4. Cup, Dish or Dome Warranty: The manufacturer warrants that the carpet tile will not cup, dish or dome for 30 years from the date of Substantial Completion.

5. Dimensional Stability Warranty: The manufacturer warrants that the carpet tile will not lose its dimensional stability (namely: growth or shrinkage with glue-down installations) for 30 years due to normal variations in atmosphere, temperature, or humidity

6. Wear Warranty: The manufacturer warrants that the carpet tile will lose no more than 10 percent by weight of the pile fiber during the life of the carpet from the date of Substantial Completion.

C. Manufacturer shall provide a 10 year material warranty for colorfastness and texture retention.

1. Stain and Soil Protection: 10 year stain removal written guaranty.

2. Texture Retention Warranty: The manufacturer warrants that the carpet tile will substantially maintain its physical surface texture against crushing, matting and walking out for 10 years from the date of Substantial Completion.

3. Colorfastness to light: Carpet tile will not fade for 10 years due to exposure to sunlight.

4. Colorfastness to atmospheric contaminants: Carpet tile will not fade for 10 years due to atmospheric contaminants.

1.07 MAINTENANCE

A. Extra Materials: Provide minimum three cartons of extra materials for each color, pattern, and dye lot of carpet.

PART 2 - PRODUCTS

2.01 MANUFACTURERS AND PRODUCTS

A. Modular Carpet Tile, Heavy Commercial Traffic:

1. Bentley Mills, Inc., Style: Elite Flex and Broadloom Collection.

2. Interface, Style: Cubic, Night Lights, Arial and Open Air Collection.

3. Mohawk Industries, Style: Fractal Findings and Live and Learn Collection.

4. Shaw Contract Group, Style: No Rules Collection.

5. Equal products meeting CHPS requirements as a system and that meet or exceed the products and systems listed below.

B. Adhesives and Primers: As recommended by tile carpeting manufacturer and approved by OEHS.

2.02 MATERIALS

A. Carpet tile shall meet the following minimum standards:

1. Pile: 0.195 inch maximum height level loop. No cut pile or cut and loops will be accepted.

2. Dye Method: 85 percent Solution Dyed Method. 15 percent Yarn Dyed.

3. Construction: Maximum 24-inch by 24-inch Modular Carpet Tile. Tufted level loop (no cut or cut loop accepted).

4. Pile / Yarn weight: Minimum 17 ounces per square yard.

5. Minimum Density: Not less than 6,800.

6. Moisture Impervious: Carpet tile shall be unaffected by water and moisture.

7. Static Protection: The manufacturer warrants that the carpet tile will not static discharge in excess of 3.5 KV or under when tested under the AATCC Test Method 134 for the life of the carpet.

8. Carpet tile shall be able to be installed with 5 pounds hydrostatic pressure or better per 1,000 square feet per 24 hours with written documentation from manufacturer, per CRI-104.

9. Fluorochemical Treatment: Minimum of 500 parts per million: per CRI-102; after two hot extractions (AATCC171), minimum 400 Parts per Million per CRI TM-102.

10. Traffic Classification: Class III – Extra Heavy Commercial Traffic (more than 1000-foot traffic per day).

11. GSA Certification: Carpet tiles shall meet or exceed the General Services Administration requirements.

12. Flammability:

    a. Flooring Radiant Panel: Class I- per ASTM E648

    b. NBS Smoke Density: Less than 450 per test ASTM E662; NFPA-258

    c. Flame Resistant: Shall pass Methenamine pill test ASTM E662.

    d. Materials shall meet requirements of California Proposition 65. In case of fire, no material shall be used that emit gas and is prohibited by California Proposition 65.

13. Run Resistant Strength: Not less than 25 pounds, in accordance with the Loop Pile Run Resistance test (TP 155-86), wet or dry for a minimum of 30 years.

14. Indoor Air Quality: Carpet tile and adhesion systems shall meet or exceed CRI and EPA guidelines (green label plus certified and labeled) and may not contain any VOC's such as: 4PCH (4 phenulcyclohexeneor, SBR latex (Styrene Butadiene Rubber).

15. Recycling Program: Carpet tile shall be eligible for a recycling program (the carpet tile will be recycled and no part of the reclaimed carpet enters a landfill) either through the carpet tile manufacturer or fiber manufacturer. If project scope included removal and disposal of existing carpet or carpet tile, contractor is responsible for delivery to a certified recycling center. A recycling certificate must be submitted to OAR, with its name and address of location of recycling center, date and weight of carpet recycled. Contractor is responsible for costs associated with recycling.

B. Carpet tile shall be from one dye lot.

C. Full cartons of carpet tile shall be cut, packaged, and identified by the factory. Distributors, dealers and vendor cutting, re-packaging, and re-labeling are not permitted.

D. Stair Nosing: Universal Moldings # A-544-BA 1 commercial (butt to nosing) type or equal, installed with recommended sized screws.

E. Adhesive: Water-resistant latex-based adhesive recommended by carpet tile manufacturer for re-leasable adhesive carpet tile installation. Where primers or sealers are furnished, verify their compatibility with adhesive.

F. Crack Filler and Leveling Compound: 100 percent cementitious binder type (as defined by ASTM C150), shall be approved by Owner's Office of Environmental Health and Safety (OEHS). The following manufacturers are currently listed as approved by OEHS:

1. Webcrete #95 as manufactured by Durabond

2. Ardex SD-F as manufactured by Ardex

3. Or as recommended by flooring manufacturer and approved by LAUSD's Office of Environmental Health and Safety.

4. Leveling Compound shall meet or exceed 200 pounds when tested in accordance with ASTM 1583.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Before installation is started, examine surfaces to receive carpet tile. Deficiencies shall be corrected before starting Work of this section.

B. Field verify dimensions and other conditions affecting this Work before commencing carpet tile installation.

3.02 PREPARATION

A. Provide concrete moisture vapor emission and pH testing to concrete per Section 09 0561 - Moisture Testing for Flooring Installation for areas specified to be covered with carpet tile. Includes concrete placed below, on and above grade. For replacement projects, concrete slabs not in direct contact with ground may be excluded from this requirement. Comply with requirements of ASTM F1869.

E. Preparation of Subfloors: Any leveling compound used over a vapor or moisture barrier will be warranted to be installed in a wet or moist environment without moisture limitations.

1. Delay application of flooring until sub-floors are sufficiently dry according to flooring manufacturer’s recommendations, or perform remedial measures as recommended by flooring materials manufacturer.

F. Cleaning and Drying: Clean concrete floor slabs of oil, grease, waxes, curing compounds, dust, dirt, debris, paint, and other deleterious substances. Failure to remove or seal old adhesives or other floor coatings may result in installation failure. Provide a commercial vacuum cleaner to remove dust and dirt. Do not furnish oiled or chemical treated sawdust or any similar product for dust removal.

G. Leveling: Verify floor slabs true to level and plane within a tolerance of 3/16 inch in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Pop ups shall be hammered out and floor filled with an approved cementitious leveling compound. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with an approved cementitious leveling compound, or equivalent method. Fill low areas with an approved cementitious leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Again clean areas where repairs are performed and prime floor using recommended primer by manufacture. Do not sand, stone rub grind or power chip floor adhesives that contain asbestos.

H. Wood subfloors: Clean wood subfloors of oil, grease, waxes, dust, dirt, debris, paint, and other deleterious substances. Do not furnish oiled or chemical treated sawdust or any similar product for dust removal. Sand off projecting ridges. If recommended by

carpet tile manufacturer, prime floors with a recommended primer, compatible with adhesives to be installed.

I. Conditioning of Materials: Carpet tile and adhesives shall be conditioned at the Project site at not less than 65 degrees F and relative humidity between 10 percent and 65 percent for 48 hours prior to installation and in accordance to manufacturer's instructions.

J. Floors should be level and sound. Any trowel marks from old adhesives must be sanded smooth, creating a level surface prior to the application of adhesives and primers.

3.03 CARPET TILE INSTALLATION

A. General: Install carpet tile in accordance with requirements of CRI 104, except where more stringent requirements are specified herein or recommended by carpet materials manufacturers.

B. Install carpet tiles in each dye lot in the number sequence as furnished by manufacturer. Measure the area to find the best starting point that will utilize a maximum size perimeter tile. After selecting the starting point, snap a chalk line that bisects this point by at right angles. To achieve a perfect angle form a triangle by measuring 6-inch up from the center point. Then measure 8-inch out from the center point. Then, find a 10-inch angle between these two points. (See manufacturers written instructions for complete details).

C. Color Control: Install dye lot in the number sequence at locations indicated to prevent shading variations. Install only one dye lot for each area of building unless otherwise reviewed. If more than one dye lot is required, obtain prior review of color match between dye lots by Owner and its representative's written approval.

D. Carpet Tile Fit: Refer to the layout Shop Drawings. The corners of the carpet tiles should be flat to assure a proper fit. Install the carpet tiles snuggly. Be careful to not to over tighten the installation.

E. Laying and Seaming: Cut carpet tiles for seams between rows and prevent damage to loops, prevent edge ravels, and preserve uniform row alignment and spacing on both sides and across seams. Install carpet tiles with loop rows in straight lines both ways, free of offsets, waviness, distortion, or misalignment. Cut seam edges straight and square with backing. Trim carpet tiles at walls, columns, and penetrations for a compressed fit.

F. Doorways: Extend carpet tiles into doorways without piecing in and seam to the carpet on other side of door under door centerline except where metal thresholds occur; no small filler pieces of carpet tiles will be permitted at doorways.

G. Adhesive Installation: Provide proper equipment as required by manufacturer. Evenly spread adhesive free of excess or thin areas. Place and lay carpet tile within open time of adhesive.

H. Binder Bars: Provide bars at edges of carpet tiles not abutting walls or other construction, securely fastened in place by using aluminum drive nails. Precisely align splices and tightly miter angles.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion. Limit rolling traffic on carpet tiles for at least 12 hours after installation. Cover carpet tiles with heavy non-staining Kraft paper in areas where the Work of other trades is to be performed and/or traffic and passage areas. Protect carpet from damage or soiling. Maintain protection in place until Substantial Completion.

3.05 CLEANING

A. As each carpeted area is completed, clean up dirt and debris, remove spots and soiling with proper cleaner, trim off loose threads with sharp scissors, and vacuum entire area clean.

3.06 CLEAN-UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.07 INSTRUCTION

A. Before Substantial Completion of the Work, should the OWNER request and at the OWNER discretion, provide a four hour OWNER instruction period for proper maintenance of carpeting. Instructions shall be provided by technical representative of manufacturer.

END OF SECTION

SECTION 09 8100

ACOUSTICAL INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Acoustical insulation and sealants.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 07 2100 - Thermal Insulation.
3. Section 09 2216 - Non-Structural Metal Framing.

1.02 SUBMITTALS

A. Product Data:

1. Provide manufacturer’s printed Product Data for each product.
2. Provide manufacturer’s printed installation instructions.

1.03 QUALITY ASSURANCE

A. Fire Ratings: Comply with fire-resistance and flammability ratings specified.

B. Acoustic Performance: Acoustic Insulation shall be tested in accordance with ASTM C423, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method, with Type A (#4) mounting.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Protect insulation from physical damage and from becoming wet or soiled.

B. Comply with manufacturer’s recommendations for handling, storage and protection during installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL INSULATION

A. Unfaced Mineral/Glass Fiber Blanket/Batt Acoustical Insulation: Acoustical insulation produced by combining mineral/glass fibers with thermosetting resins to comply with ASTM C665, Type I.

1. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50 when tested in accordance with ASTM E84.

2. Manufacturers: Johns Manville "Sound Control Batts", Owens Corning "Sound Attenuation Batts", or equal.

3. Thickness: 3-inch unless otherwise indicated.

2.02 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Concealed Joints: Non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound:

1. Pecora Corp. "BA-98".

2. Tremco Inc. "Tremco Acoustical Sealant".

3. Hilti, Inc. “CP 506”.

4. Equal.

B. Acoustical Sealant for Exposed Joints: Non-oxidizing, non-hardening, skinnable, paintable, gunnable sealant recommended for sealing interior exposed joints to reduce transmission of airborne sound.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's instructions for installation conditions.

B. Do not install insulation until building is sufficiently enclosed or protected against absorption of moisture by the insulation, and do not install insulation unless supporting framing and construction is in a thoroughly dry condition.

C. Install snugly between framing members with ends snugly fitted between units and against adjacent construction.

D. Carefully cut and fit insulation around pipes, conduit, and other obstructions and penetrations.

E. Where door and window frames occur in framing; cut additional strips of insulation and hand-pack as required to fill voids in and around such frames.

F. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated. Install sealants in accordance with manufacturer's instructions.

3.02 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose off of Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 09 9000

PAINTING AND COATING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Interior and exterior painting.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 03 3000 Cast in Place Concrete
3. Section 04 2200 Concrete Unit Masonry
4. Section 05 0513 Hot-Dip Galvanizing
5. Section 05 1200 Structural Steel Framing
6. Section 05 3000 Metal Decking
7. Section 05 5100 Metal Stairs and Railings
8. Section 06 1000 - Rough Carpentry.
9. Section 06 2000 - Finish Carpentry.
10. Section 06 4000 Architectural Woodwork
11. Section 07 6000 Flashing and Sheet Metal
12. Section 07 9200 - Joint Sealants.
13. Section 08 1113 Hollow Metal Doors and Frames
14. 08 1416 Flush Wood Doors
15. 08 3116 Access Panels and Frames
16. 08 5123 Steel Windows
17. Section 09 2423 - Cement Plaster and Metal Lath.
18. 09 2427 Cement Plaster for Murals
19. Section 09 2900 - Gypsum Board.

20. Section 09 9623 – Graffiti - Resistant Coatings.

C. Following items shall not be painted:

1. Brass valves, chromium or nickel-plated piping and fittings.

2. Boiler control panels and control systems.

3. Fabric connections to fans.

4. Flexible conduit connections to equipment, miscellaneous name plates, stamping, and instruction labels and manufacturer's data.

5. Mechanical and electrical utility lines, piping and heating and ventilation ductwork in tunnels, under-floor excavated areas or crawl spaces, attic spaces and enclosed utility spaces.

6. Flag, floodlight, parking light poles and loudspeaker poles, metal stairs, handrails and chain-link fence with a galvanized finish, unless otherwise noted.

7. Structural and miscellaneous steel, open web steel joists and metal floor decking, which will not be exposed in final construction, shall have no finish other than one coat of shop primer.

8. Hardboard covering on tops and backs of counters and benches.

9. Brass, bronze, aluminum, lead, stainless steel and chrome or nickel-plated surfaces.

10. Non-metallic walking surfaces unless specifically shown or specified to be painted.

1.02 REGULATORY REQUIREMENTS

A. Paint materials shall comply with the Food and Drug Administration’s (F.D.A.) Lead Law and the current rules and regulations of local, state and federal agencies governing the use of paint materials.

1.03 SUBMITTALS

A. List of Materials: Before submittal of samples, submit a complete list of proposed paint materials, identifying each material by distributor's name, manufacturer’s name, product name and number, including primers, thinners, and coloring agents, together with manufacturers’ catalog data fully describing each material as to contents, recommended installation, and preparation methods. Identify surfaces to receive various paint materials.

B. Material Samples: Submit manufacturer's standard colors samples for each type of paint specified. Once colors have been selected, submit Samples of each color selected for each type of paint accordingly:

1. Samples of Paint and Enamel must be submitted on standard 8 ½" x 11" Leneta Opacity-Display Charts. Each display chart shall have the color in full coverage. The sample shall be prepared from the material to be installed on the Work. Identify the school on which the paint is to be installed, the batch number, the color number, the type of material, and the name of the manufacturer.

2. Elastomeric shall be submitted in duplicate samples of the texture coating. Samples will be not less than 2 ½ by 3 ½ in size and installed upon backing. Finished Work shall match the reviewed Sample in texture.

3. Materials and color samples shall be reviewed before starting any painting.

C. For transparent and stained finishes, prepare samples on same species and quality of wood to be installed in the Work, with written description of system used.

1.04 QUALITY ASSURANCE

A. Certification of Materials: With every delivery of paint materials, the manufacturer shall provide written certification the materials comply with the requirements of this section.

B. Coats: The number of coats specified is the minimum number. If full coverage is not obtained with the specified number of coats, install additional coats as required to provide the required finish.

C. Install coats and undercoats for finishes in strict accordance with the recommendations of the paint manufacturer as reviewed by the Architect.

D. Paint materials shall comply with the following as a minimum requirement:

1. Materials shall be delivered to Project site in original unbroken containers bearing manufacturer's name, brand number and batch number.

2. Open and mix ingredients on premises in presence of the Project Inspector.

E. Pre-Construction Meeting: Prior to start of Work of this section and after approval of submittals, schedule an onsite meeting between CONTRACTOR, OAR, Project Inspector, representatives of the paint manufacturer, and painting subcontractor to review construction conditions and to discuss conformance to the requirements of this Section prior to paint application.

1.05 DELIVERY, STORAGE AND HANDLING

A. Storage and Mixing of Materials: Store materials and mix only in spaces suitable for such purposes. Maintain spaces clean and provide necessary precautions to prevent fire. Store paint containers so the manufacturer's labels are clearly displayed.

1.06 SITE CONDITIONS

A. Temperature: Do not install exterior paint in damp, rainy weather or until surface has thoroughly dried from effects of such weather. Do not install paint, interior, or exterior, when temperature is below 50 degrees F, or above 90 degrees F, or dust conditions are unfavorable for installation.

1.07 WARRANTY

A. Manufacturer shall provide a three year material warranty.

B. Installer shall provide a three year application warranty.

1.08 MAINTENANCE

A. Provide at least one gallon of each type, color and sheen of paint coating installed. Label containers with color designation indicated on Drawings.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS

A. Furnish the products of only one paint manufacturer unless otherwise specified or required. Primers, intermediate and finish coats of each painting system must all be the products of the same manufacturer, including thinners and coloring agents, except for materials furnished with shop prime coat by other trades.

B. B. Factory mix paint materials to correct color, gloss, and consistency for installation to the maximum extent feasible.

C. Paint materials to be minimum “Architectural Grade”.

D. Gloss degree standards shall be as follows:

GLOSS	70 and above	EGGSHELL	30 to 47
SEMI-GLOSS	48 to 69	SATIN	15 to 29

2.02 MANUFACTURERS

A. Acceptable manufacturers, unless otherwise noted:

1. Dunn-Edwards Corporation Paints.

2. Behr Paint Company.

3. Vista Paints.

4. Sherwin Williams.

5. Benjamin Moore.

6. Ever-Gard Paint; a subsidiary of Shilpark Paint

7. Equal.

PART 3 - EXECUTION

3.01 PREPARATION

A. Examine surfaces to receive paint finish. Surfaces which are not properly prepared and cleaned or which are not in condition to receive the finish specified shall be corrected before prime coat is installed.

B. New woodwork shall be thoroughly cleaned, hand sandpapered, and dusted off. Nail holes, cracks or defects in Work shall be filled. On stained woodwork, fill shall be colored to match stain. Filling shall be performed after the first coat of paint, shellac or varnish has been installed.

C. Plaster surfaces except veneer plaster shall be allowed to dry at least 3 weeks before painting. Veneer plaster shall be allowed to dry sufficiently to receive paint as determined by moisture meter tests.

D. Metal surfaces to be painted shall be thoroughly cleaned of rust, corrosion, oil, foreign materials, blisters, and loose paint.

E. Do not install painting materials to wet, damp, dusty, dirty, finger marked, rough, unfinished or defective surfaces.

F. Concrete surfaces shall be dry, cleaned of dirt and foreign materials and in proper condition to receive paint. Neutralize spots demonstrating effects of alkali.

G. Mask off areas where necessary.

3.02 APPLICATION

A. Backpainting: Immediately upon delivery to the Project site, finish lumber and millwork shall be backpainted on surfaces that will be concealed after installation. Items to be painted shall be backpainted with priming coat specified under "Priming".

B. Priming: New wood and metal surfaces specified to receive paint finish shall be primed. Surfaces of miscellaneous metal and steel not embedded in concrete, and surfaces of unprimed plain sheet metal Work shall be primed immediately upon delivery to the Project site. Galvanized metal Work and interior and exterior woodwork shall be primed immediately after installation. Priming of surfaces and priming coat shall be as follows:

1. Knots, Pitch and Sap Pockets: Shellac before priming.

2. Exterior Woodwork and Wood Doors: Prime with one coat of exterior waterborne emulsion wood primer.

3. Interior Woodwork: Where indicated to be painted, prime with one coat of waterborne wood primer.

4. Stain: Woodwork indicated to receive a stain and varnish finish shall be stained to an even color with water borne stain. On open-grained hardwood, mix stain with paste filler and completely fill pores in wood.

5. Galvanized Metal Work: Clean oil, grease and other foreign materials from surfaces. Install vinyl wash pretreatment coating. Follow manufacturer's instructions for drying time, and then prime with one coat of metal primer.

6. Unprimed Iron, Steel, and Other Uncoated Metals: Where specified to be painted, prime with one coat of metal primer.

7. Shop Primed Metal Items: Touch up bare and abraded areas with metal primer before installation of second and third coats.

8. Coats shall be installed evenly and with full coverage. Finished surfaces shall be free of sags, runs and other imperfections.

C. Allow at least 24 hours between coats of paint.

D. To ensure proper coverage when rolling, a metal bucket screen/grid must be used.

E. Rollers shall not be used on wood surfaces except as indicated for wood overhangs below

F. Each coat of painted woodwork and metal, except last coat, shall be sandpapered smooth when dry. Texture-coated gypsum board shall be sanded lightly to remove surface imperfections after first coat of paint has been installed.

G. Each coat of paint or enamel shall be a slightly different tint as required. Each coat of paint, enamel, stain, shellac, and varnish will be inspected by the Project Inspector before next coat is applied. Notify the Project Inspector that such Work is ready for inspection.

1. Tinting Guideline: The first coat, primer/undercoat(s) to be untinted or tinted up to 50 percent lighter or darker (at the discretion of the installer) than the finish coat. The second coat (or third coat if a seal coat and undercoat have been specified) is to be factory tinted in the range of 10 percent to 15 percent lighter or darker (at the discretion of the installer) than the finish coat. The final coat is to be factory tinted to the required color selected. These tinting guidelines shall be provided on all surfaces receiving paint.

H. Do not "paint-out" UL labels, fusible links and identification stamps.

I. Paint Roller, brush and spray.

1. Only Paint rollers or spray shall be used on interior/exterior plaster, drywall, masonry/plaster and plywood surfaces. Roller nap shall not exceed one half inch in length.

2. First coat on wood overhang and ceilings shall have material applied by roller and then brushed out in a professional manner to leave surface free of imperfections. Finish coat may be sprayed.

3. Other surfaces shall have all coatings applied with brushes of proper size.

J. Where ceilings are specified to be painted, beams, cornices, coves, ornamental features, plaster grilles, etc. shall be included.

K. Unless otherwise indicated ceilings shall be white, including classrooms, storage rooms, offices, arcades, etc. Boiler room and fan room ceiling color shall match adjacent walls.

3.03 CLEANING

A. Remove rubbish, waste, and surplus material and clean woodwork, hardware, floors, and other adjacent Work.

B. Remove paint, varnish and brush marks from glazing material and, upon completion of painting Work, wash and polish glazing material both sides. Glazing material, which is damaged, shall be removed and replaced with new material.

C. Clean hardware and other unpainted metal surfaces with recommended cleaner. Do not furnish abrasives or edged tools.

3.04 SCHEDULE

A. Interior:

1. Woodwork, Painted: 3 coats.

   a. First Coat: As specified in this section under Priming.

   b. Second and Third Coats: Interior enamel, gloss.

2. Woodwork, Stained and Varnished: 4 coats.

   a. First Coat: As specified in this section under Priming.

   b. Second, Third and Fourth Coats: Varnish, semi-gloss.

3. Wood Corridor doors: 4 coats.

   a. First Coat: As specified in this section under Priming.

   b. Second, Third, and Fourth Coats: Varnish, gloss.

4. Other Wood Doors: 4 coats.

   a. Varnished or painted as indicated.

   b. If painted, same finish system as painted woodwork, gloss.

5. Miscellaneous Woodwork: 4 coats. Wood items including, but not limited to stair treads and risers, handrails, rolling ladders, wood base and shoe, chair rails, counter tops and locker room benches.

    a. First Coat: As specified in this section under Priming.

    b. Second, Third and Fourth: Exterior varnish, gloss.

6. Casework: Interior surfaces of casework (except plastic laminate-faced casework) including top, edges and underside of shelving, poles, surfaces of drawers (except fronts), interior surfaces of mailbox pigeonholes, and particle board.

    a. First Coat: Waterborne stain.

    b. Second and Third Coats: Satin varnish.

7. Plaster: 4 coats.

    a. First Coats: Pigmented wall sealer.

    b. Second coat: Enamel under coater.

    c. Third and Fourth Coats – Interior enamel, semi-gloss or gloss as indicated.

8. Gypsum Board: 4 coats.

    a. First Coat: Drywall sealer.

    b. Second Coat: Enamel under coater.

    c. Third and Fourth Coats: Interior enamel, semi-gloss or gloss as indicated.

9. Concrete: 3 coats.

    a. First: Concrete sealer.

    b. Second and Third: Interior enamel, semi-gloss or gloss as indicated.

10. Concrete Block: 3 coats.

    a. First: Concrete block filler.

    b. Second and Third: Interior enamel, semi-gloss or gloss as indicated.

11. Metal: Shall be cleaned, pre-treated and painted with 3 coats. Items to be painted include but are not limited to exposed structural and miscellaneous steel, metal doors and frames, ladders, table and bench legs.

    a. First Coat: Metal primer.

b. Second and Third Coats: Interior gloss enamel, except metal doors and frames which shall be gloss

B. Exterior:

1. Woodwork: 3 coats.

a. First Coat: As specified in this section under Priming.

b. Second and Third Coats: Exterior gloss enamel.

2. Wood Doors: 3 coats.

a. First Coat: As specified in this section under Priming.

b. Second and Third Coats: Exterior gloss enamel.

3. Plaster and Stucco: 3 coats. Flat 100 percent acrylic.

a. Prime Coat: Alkali resistant primer/sealer.

b. Exterior 100 percent acrylic.

4. Concrete: 3 coats. Flat 100 percent acrylic.

a. First Coat: Concrete sealer.

b. Second and Third Coats: Exterior 100 percent acrylic.

5. Concrete Block: 3 coats. Flat 100 percent acrylic.

a. First Coat: Concrete block filler.

b. Second and Third Coats: Exterior 100 percent acrylic.

6. Metal: 3 coats. Shall be cleaned and pre-treated. Items to be painted include but are not limited to steel columns and miscellaneous steel items, gravel stops, metal doors and frames, hoods and flashings.

a. First Coat: As specified in this section under Priming.

b. Second and Third Coats: Exterior gloss enamel.

C. Mechanical and Electrical Work:

1. Except where interior mechanical and electrical Work to be painted is specified to receive another paint finish, Work occurring in finished rooms and spaces shall be cleaned, pre-treated, and painted with 3 coats. Items to be painted include but are not limited to Steel and copper piping, pipes, vents, fittings, ducts, plenums, miscellaneous supports and hangers, electrical conduit, fittings, pull boxes, outlet boxes, unfinished surfaces of plumbing fixtures, miscellaneous metal cabinets, panels, and access doors and panels.

a. First Coat: As specified in this section under Priming.

b. Second and Third Coats: Interior enamel, semi-gloss or gloss to match adjacent wall or ceiling finish.

2. Insulation and Taping on Pipes and Ducts: 3 coats.

a. Finished Rooms:

1) First Coat: Interior waterborne primer.

2) Second and Third Coats: Interior semi-gloss or gloss enamel to match adjoining wall or ceiling finish.

b. Building Exterior:

1) First Coat: Exterior waterborne primer.

2) Second and Third Coats: Exterior gloss enamel.

3. Inside surfaces of ducts, vents, dampers and louvers as far back as visible from room in which they open shall be painted with 2 coats of flat black paint.

D. Miscellaneous:

1. Outside Storage Units (wood or metal): 3 coats.

a. First Coat: As specified in this section under Priming.

b. Second and Third Coats: Exterior gloss enamel.

2. Exterior and interior surfaces of storage bins, and potting tables shall have 3 coats of acrylic stain.

3. Wood compost bins shall be finished with 3 coats of acrylic stain.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.06 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 26 05 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Single conductor building wire.

B. Metal-clad cable.

C. Wiring connectors.

D. Electrical tape.

E. Heat shrink tubing.

F. Wire pulling lubricant.

1.3 RELATED REQUIREMENTS

A. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

B. Section 28 3100 - Fire Detection and Alarm: Fire alarm system conductors and cables.

C. Section 31 2316 - Excavation.

D. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

1.4 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2001 (Reapproved 2007).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010.

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2009).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010

F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2008.

G. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

H. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); National Electrical Contractors Association; 2006.

I. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; National Electrical Manufacturers Association; 2009 (ANSI/NEMA WC 70/ICEA S- 95-658).

J. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

N. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

O. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

P. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

Q. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

R. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.6 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Field Quality Control Test Reports.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Underground feeder and branch-circuit cable is not permitted.

D. Metal-clad cable is permitted only as follows:

1. Where not otherwise restricted, may be used:

a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.

1) Maximum Length: 4 feet.

b. Where concealed in hollow stud walls for branch circuits up to 20 A.

2. In addition to other applicable restrictions, may not be used:

a. Where not approved for use by the authority having jurisdiction.

b. Where exposed to view.

c. Where exposed to damage.

d. For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.

2.2 ALL CONDUCTORS AND CABLES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.

H. Conductors and Cables Installed in Cable Tray: Listed and labeled as suitable for cable tray use.

I. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.

J. Conductor Material:

1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.

2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B 787M unless otherwise indicated.

3. Tinned Copper Conductors: Comply with ASTM B33.

K. Minimum Conductor Size:

1. Branch Circuits: 12 AWG.

a. Exceptions:

1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.

2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.

3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.

L. Conductor Color Coding:

1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.

2. Color Coding Method: Integrally colored insulation.

3. Color Code:

a. 480Y/277 V, 3 Phase, 4 Wire System:

1) Phase A: Brown.

2) Phase B: Orange.

3) Phase C: Yellow.

4) Neutral/Grounded: Gray.

b. 208Y/120 V, 3 Phase, 4 Wire System:

1) Phase A: Black.

2) Phase B: Red.

3) Phase C: Blue.

4) Neutral/Grounded: White.

c. Equipment Ground, All Systems: Green.

d. Travelers for 3-Way and 4-Way Switching: Pink.

2.3 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:

1. Feeders and Branch Circuits:

a. Size 10 AWG and Smaller: Solid.

b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:

1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.4 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:

1. Size 10 AWG and Smaller: Solid.

2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Provide oversized neutral conductors where indicated or required.

F. Provide dedicated neutral conductor for each phase conductor where indicated or required.

G. Grounding: Full-size integral equipment grounding conductor.

H. Armor: Steel, interlocked tape.

I. Provide PVC jacket applied over cable armor where indicated or required for environment of installed location.

2.5 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 0526.

C. Wiring Connectors for Splices and Taps:

1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.

2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.

2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.

3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.

4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.

E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

F. Mechanical Connectors: Provide bolted type or set-screw type.

G. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.6 WIRING ACCESSORIES

A. Electrical Tape:

1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.

2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.

4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.

5. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

A. Circuiting Requirements:

1. Unless dimensioned, circuit routing indicated is diagrammatic.

2. When circuit destination is indicated and routing is not shown, determine exact routing required.

3. Arrange circuiting to minimize splices.

4. Include circuit lengths required to install connected devices within 10 ft of location shown.

5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.

6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.

7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Install conductors and cable in a neat and workmanlike manner in accordance with NECA 1.

D. Install metal-clad cable (Type MC) in accordance with NECA 120.

E. Installation in Raceway:

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.

2. Pull all conductors and cables together into raceway at same time.

3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.

4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

H. Terminate cables using suitable fittings.

1. Metal-Clad Cable (Type MC):

a. Use listed fittings.

b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

I. Install conductors with a minimum of 12 inches of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. Make wiring connections using specified wiring connectors.

1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.

2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.

3. Do not remove conductor strands to facilitate insertion into connector.

4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

    a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.

2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

    a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.

    b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

3. Wet Locations: Use heat shrink tubing.

M. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.4 FIELD QUALITY CONTROL

A. Perform inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Single conductor building wire.

B. Metal-clad cable.

C. Wiring connectors.

D. Electrical tape.

E. Heat shrink tubing.

F. Oxide inhibiting compound.

G. Wire pulling lubricant.

1.3 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.4 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2001 (Reapproved 2007).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010.

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2009).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.

F ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2008.

G NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

H NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); National Electrical Contractors Association; 2006.

I NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; National Electrical Manufacturers Association; 2009 (ANSI/NEMA WC 70/ICEA S- 95-658).

J NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

K NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

M UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

N UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

O UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

P UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

Q UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

R UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.6 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Metal-clad cable is permitted only as follows:

1. Where not otherwise restricted, may be used:

a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.

b. Maximum Length: 4 feet.

c. Where concealed in hollow stud walls for branch circuits up to 20 A.

d. Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.

2. In addition to other applicable restrictions, may not be used:

a. Where not approved for use by the authority having jurisdiction.

b. Where exposed to view.

c. Where exposed to damage.

2.2 ALL CONDUCTORS AND CABLES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.

H. Conductor Material:

1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.

2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787787M unless otherwise indicated.

3. Tinned Copper Conductors: Comply with ASTM B33.

I. Minimum Conductor Size:

1. Branch Circuits: 12 AWG.

a. Exceptions:

1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.

2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.

3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.

J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

K. Conductor Color Coding:

1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.

2. Color Coding Method: Integrally colored insulation.

a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.

3. Color Code:

a. 480Y/277 V, 3 Phase, 4 Wire System:

1) Phase A: Brown.

2) Phase B: Orange.

3) Phase C: Yellow.

4) Neutral/Grounded: Gray.

b. 208Y/120 V, 3 Phase, 4 Wire System:

1) Phase A: Black.

2) Phase B: Red.

3) Phase C: Blue.

4) Neutral/Grounded: White.

c. Equipment Ground, All Systems: Green.

d. Travelers for 3-Way and 4-Way Switching: Pink.

2.3 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:

1. Feeders and Branch Circuits:

a. Size 10 AWG and Smaller: Solid.

b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:

1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

a. Size 4 AWG and Larger: Type XHHW-2.

b. Installed Underground: Type XHHW-2.

2.4 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:

1. Size 10 AWG and Smaller: Solid.

2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Provide dedicated neutral conductor for each phase conductor where indicated or required.

F. Grounding: Full-size integral equipment grounding conductor.

G. Armor: Steel, interlocked tape.

2.5 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

C. Wiring Connectors for Splices and Taps:

1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.

2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.

2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.

3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.

4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.

5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

G. Mechanical Connectors: Provide bolted type or set-screw type.

H. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.6 WIRING ACCESSORIES

A. Electrical Tape:

1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.

2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.

4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.

5. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage wire and cable has been completed.

B. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

C. Verify that field measurements are as shown on the drawings.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

A. Circuiting Requirements:

1. Unless dimensioned, circuit routing indicated is diagrammatic.

2. When circuit destination is indicated and routing is not shown, determine exact routing required.

3. Arrange circuiting to minimize splices.

4. Include circuit lengths required to install connected devices within 10 ft of location shown.

5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.

6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.

7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are shown as separate, combining them together in a single raceway is permitted, under the following conditions:

a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.

b. Increase size of conductors as required to account for ampacity derating.

c. Size raceways, boxes, etc. to accommodate conductors.

8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Install conductors and cable in a neat and workmanlike manner in accordance with NECA 1.

D. Install metal-clad cable (Type MC) in accordance with NECA 120.

E. Installation in Raceway:

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.

2. Pull all conductors and cables together into raceway at same time.

3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.

4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

H. Terminate cables using suitable fittings.

1. Metal-Clad Cable (Type MC):

a. Use listed fittings.

b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

I. Install conductors with a minimum of 12 inches of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. Make wiring connections using specified wiring connectors.

1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.

2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.

3. Do not remove conductor strands to facilitate insertion into connector.

4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

2. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.

3. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.

b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

4. Wet Locations: Use heat shrink tubing.

M. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods as specified.

P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.4 FIELD QUALITY CONTROL

A. Perform inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

D. Ground bars.

E. Ground rod electrodes.

F. Ground access wells.

1.3 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

C. Section 26 56 00 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

1.4 REFERENCE STANDARDS

A. IEEE 81 - Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System; 1983.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; National Electrical Manufacturers Association; 2007.

D. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

E. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify exact locations of underground metal water service pipe entrances to building.

2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.

3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.6 SUBMITTALS

A. See Section 01 33 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Grounding System Resistance:

1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.

2. Grounding Electrode System: Not greater than 25 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

E. Grounding Electrode System:

1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.

a. Provide continuous grounding electrode conductors without splice or joint.

b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.

2. Metal Underground Water Pipe(s):

a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least

b. 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.

c. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.

d. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.

3. Metal Building or Structure Frame:

a. Provide connection to metal building or structure frame effectively grounded in accordance with NFPA 70 at nearest accessible location.

4. Concrete-Encased Electrode:

a. Provide connection to concrete-encased electrode consisting of not less than 20 feet of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.

5. Ground Rod Electrode(s):

a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.

b. Space electrodes not less than 10 feet from each other and any other ground electrode.

c. Where location is not indicated, locate electrode(s) at least 5 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.

6. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

7. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service- supplied system grounding to this ground bar.

a. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.

b. Where ground bar location is not indicated, locate in accessible location as near as possible to service disconnect enclosure.

c. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

F. Separately Derived System Grounding:

1. Separately derived systems include, but are not limited to:

a. Transformers (except autotransformers such as buck-boost transformers).

2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.

3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.

4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.

5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

G. Bonding and Equipment Grounding:

1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Raceways may be used as sole equipment grounding conductor where permitted by NFPA 70. Provide insulated equipment grounding conductor where indicated or required, including but not limited to:

    a. In each nonmetallic feeder and branch circuit raceway.

    b. In each flexible conduit.

    c. In each feeder.

3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.

4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:

    a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.

    b. Metal gas piping.

8. Provide bonding for metal building frame where not used as a grounding electrode.

H. Communications Systems Grounding and Bonding:

1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.

2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.

    a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.

b. Raceway Size: 3/4 inch unless otherwise indicated or required.

c. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.

d. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.

2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in addition to requirements of Section 26 05 19:

1. Use insulated copper conductors unless otherwise indicated.

a. Exceptions:

1) Use bare copper conductors where installed underground in direct contact with earth.

2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:

1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.

2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.

3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:

1. Description: Copper rectangular ground bars with mounting brackets and insulators.

2. Size: As indicated.

3. Holes for Connections: As indicated or as required for connections to be made.

E. Ground Rod Electrodes:

1. Comply with NEMA GR 1.

2. Material: Copper-bonded (copper-clad) steel.

3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.

F. Ground Access Wells:

1. Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.

2. Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.

a. Round Wells: Not less than 8 inches in diameter.

3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches.

4. Cover: Factory-identified by permanent means with word "GROUND".

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install grounding and bonding system components in a neat and workmanlike manner in accordance with NECA 1.

C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.

D. Make grounding and bonding connections using specified connectors.

1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.

2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.

3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.

4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Perform inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect and test in accordance with NETA STD ATS except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.13.

D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

SECTION 26 05 34

CONDUIT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Intermediate metal conduit (IMC).

C. PVC-coated galvanized steel rigid metal conduit (RMC).

D. Flexible metal conduit (FMC).

E. Liquid tight flexible metal conduit (LFMC).

F. Electrical metallic tubing (EMT).

G. Rigid polyvinyl chloride (PVC) conduit.

H. Conduit fittings.

I. Accessories.

1.3 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete encasement of conduits.

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

C. Section 26 05 37 - Boxes.

E. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.4 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.

B. ANSI C80.3 - American National Standard for Steel Electrical Metallic Tubing (EMT); 2005.

C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); National Electrical Contractors Association; 2006.

F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); National Electrical Contractors Association; 2003.

G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

H. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; National Electrical Manufacturers Association; 2005.

I. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; National Electrical Manufacturers Association; 2003.

J. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association; 2004.

K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

M. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

N. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

O. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

P. UL 651 - Schedule 40 and 80 Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

Q. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

R. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.

4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.

5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.6 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

B. Shop Drawings:

1. Include proposed locations of roof penetrations and proposed methods for sealing.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:

1. Under Slab on Grade: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.

2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.

3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.

4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit where emerging from underground.

5. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.

6. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.

7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Embedded Within Concrete:

1. Within Slab on Grade: Not permitted.

2. Within Slab Above Ground: Not permitted.

3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from concrete.

E. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

F. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

G. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

H. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

I. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

J. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

K. Exposed, Exterior: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit.

L. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

M. Corrosive Locations Above Ground: Use PVC-coated galvanized steel rigid metal conduit.

N. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.

O. Connections to Vibrating Equipment:

1. Dry Locations: Use flexible metal conduit.

2. Damp, Wet, or Corrosive Locations: Use liquid tight flexible metal conduit.

3. Maximum Length: 4 feet unless otherwise indicated.

4. Vibrating equipment includes, but is not limited to:

a. Transformers.

b. Motors.

c. HVAC equipment.

2.2 CONDUIT REQUIREMENTS

A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.

C. Minimum Conduit Size, Unless Otherwise Indicated:

1. Branch Circuits: 1/2 inch (16 mm) trade size.

2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.

3. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.

4. Underground, Interior: 3/4 inch (21 mm) trade size.

5. Underground, Exterior: 1 inch (27 mm) trade size.

D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:

1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.4 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:

1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.5 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil.

C. PVC-Coated Fittings:

1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.

2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.

3. Material: Use steel or malleable iron.

4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil.

D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil.

2.6 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

2.7 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

2.8 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

3. Connectors and Couplings: Use compression (gland) or set-screw type.

a. Do not use indenter type connectors and couplings.

2.9 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:

1. Manufacturer: Same as manufacturer of conduit to be connected.

2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.10 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound- force.

E. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that mounting surfaces are ready to receive conduits.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install conduit in a neat and workmanlike manner in accordance with NECA 1.

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install intermediate metal conduit (IMC) in accordance with NECA 101.

E. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

F. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

G. Conduit Routing:

1. Unless dimensioned, conduit routing indicated is diagrammatic.

2. When conduit destination is indicated and routing is not shown, determine exact routing required.

3. Conceal all conduits unless specifically indicated to be exposed.

4. Conduits in the following areas may be exposed, unless otherwise indicated:

a. Electrical rooms.

b. Mechanical equipment rooms.

c. Within joists in areas with no ceiling.

5. Unless otherwise approved, do not route conduits exposed:

a. Across roofs.

b. Across top of parapet walls.

c. Across building exterior surfaces.

6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.

7. Arrange conduit to maintain adequate headroom, clearances, and access.

8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.

9. Arrange conduit to provide no more than 150 feet between pull points.

10. Route conduits above water and drain piping where possible.

11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.

12. Maintain minimum clearance of 6 inches between conduits and piping for other systems.

13. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:

a. Heaters.

b. Hot water piping.

c. Flues.

H. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.

2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.

4. Use conduit strap to support single surface-mounted conduit.

5. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.

6. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.

7. Use conduit clamp to support single conduit from beam clamp or threaded rod.

8. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.

9. Use of spring steel conduit clips for support of conduits is not permitted.

10. Use of wire for support of conduits is not permitted.

I. Connections and Terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2. Where two threaded conduits must be joined and neither can be rotated, use three- piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquid tight flexible conduit connections to prevent drainage of liquid into connectors.

5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.

6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.

7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.

8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.

2. Make penetrations perpendicular to surfaces unless otherwise indicated.

3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.

4. Conceal bends for conduit risers emerging above ground.

5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.

6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.

8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

K. Underground Installation:

1. Provide trenching and backfilling in accordance with Sections 31 2316 and 31 2323.

2. Minimum Cover, Unless Otherwise Indicated or Required:

a. Underground, Exterior: 24 inches.

b. Under Slab on Grade: 12 inches to bottom of slab.

3. Provide underground warning tape in accordance with Section 26 0553 along entire conduit length for service entrance where not concrete-encased.

L. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide concrete in accordance with Section 03 3000 with minimum concrete cover of 3 inches on all sides unless otherwise indicated.

M. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.

2. Where conduits are subject to earth movement by settlement or frost.

N. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:

1. Where conduits pass from outdoors into conditioned interior spaces.

2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

O. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

P. Provide grounding and bonding in accordance with Section 26 0526.

3.3 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

3.4 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.5 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 05 37

BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

C. Floor boxes.

D. Underground boxes/enclosures.

1.3 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 29 - Hangers and Supports for Electrical Systems.

C. Section 26 05 34 - Conduit:

1. Conduit bodies and other fittings.

2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.

D. Section 26 27 26 - Wiring Devices:

1. Wall plates.

2. Floor box service fittings.

3. Additional requirements for locating boxes for wiring devices.

1.4 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association; 2008 (Revised 2010) (ANSI/NEMA OS 1).

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.

F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. SCTE 77 - Specification for Underground Enclosure Integrity; Society of Cable Telecommunications Engineers; 2010 (ANSI/SCTE 77).

H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.

4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.

5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.

6. Coordinate the work with other trades to preserve insulation integrity.

7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.

8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.6 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, floor boxes, and underground boxes/enclosures.

1. Underground Boxes/Enclosures: Include reports for load testing in accordance with SCTE 77 certified by a professional engineer or an independent testing agency upon request.

B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 BOXES

A. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.

2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.

3. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.

4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.

2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.

3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit or exposed intermediate metal conduit (IMC) is used.

4. Use suitable concrete type boxes where flush-mounted in concrete.

5. Use suitable masonry type boxes where flush-mounted in masonry walls.

6. Use raised covers suitable for the type of wall construction and device configuration where required.

7. Use shallow boxes where required by the type of wall construction.

8. Do not use "through-wall" boxes designed for access from both sides of wall.

9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.

10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.

11. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.

12. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes.

13. Minimum Box Size, Unless Otherwise Indicated:

    a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.

    b. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.

14. Wall Plates: Comply with Section 26 2726.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:

1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.

2. NEMA 250 Environment Type, Unless Otherwise Indicated:

    a. Indoor Clean, Dry Locations: Type 1, painted steel.

    b. Outdoor Locations: Type 3R, painted steel.

3. Junction and Pull Boxes Larger Than 100 cubic inches:

a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

4. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.

D. Floor Boxes:

1. Description: Floor boxes compatible with floor box service fittings provided in accordance with Section 26 2726; with partitions to separate multiple services; furnished with all components, adapters, and trims required for complete installation.

2. Use cast iron floor boxes within slab on grade.

3. Metallic Floor Boxes: Fully adjustable (with integral means for leveling adjustment prior to and after concrete pour).

4. Manufacturer: Same as manufacturer of floor box service fittings.

E. Underground Boxes/Enclosures:

1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.

2. Size: As indicated on drawings.

3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.

4. Applications:

a. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 15 load rating.

b. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.

5. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that mounting surfaces are ready to receive boxes.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:

1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.

2. Unless dimensioned, box locations indicated are approximate.

3. Locate boxes as required for devices installed under other sections or by others.

a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.

4. Locate boxes so that wall plates do not span different building finishes.

5. Locate boxes so that wall plates do not cross masonry joints.

6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.

7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.

8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.

9. Fire-Resistance-Rated Walls: Install flush-mounted boxes such that the required fire-resistance will not be reduced.

a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.

10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0534.

11. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:

    a. Concealed above accessible suspended ceilings.

    b. Within joists in areas with no ceiling.

    c. Electrical rooms.

I. Box Supports:

1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.

2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:

1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.

2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.

3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

L. Install boxes as required to preserve insulation integrity.

M. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

N. Underground Boxes/Enclosures:

1. Install enclosure on gravel base, minimum 6 inches deep.

2. Flush-mount enclosures located in concrete or paved areas.

3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.

4. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

O. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods as specified.

Q. Close unused box openings.

R. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

S. Provide grounding and bonding in accordance with Section 26 0526.

3.3 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.4 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Voltage markers.

E. Underground warning tape.

F. Floor marking tape.

G. Warning signs and labels.

1.3 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2007.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2007.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.

B. Sequencing:

1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.

2. Do not install identification products until final surface finishes and painting are complete.

1.5 SUBMITTALS

A. See Section 01 33 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

C. Samples:

1. Identification Nameplates: One of each type and color specified.

2. Warning Signs and Labels: One of each type and legend specified.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.7 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 - PRODUCTS

2.1 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:

1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.

a. Switchboards:

1) Identify ampere rating.

2) Identify voltage and phase.

3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Use identification nameplate to identify main overcurrent protective device.

5) Use identification nameplate to identify load(s) served for each branch device. Identify spares and spaces.

b. Panelboards:

1) Identify ampere rating.

2) Identify voltage and phase.

3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.

5) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

c. Transformers:

1) Identify power source and circuit number. Include location when not within sight of equipment.

2) Identify load(s) served. Include location when not within sight of equipment.

d. Enclosed switches, circuit breakers, and motor controllers:

1) Identify voltage and phase.

2) Identify power source and circuit number. Include location when not within sight of equipment.

e. Enclosed Contactors:

1) Identify ampere rating.

2) Identify voltage and phase.

2. Service Equipment:

a. Use identification nameplate to identify each service disconnecting means.

b. Use identification nameplate at each piece of service equipment to identify the available fault current and the date calculations were performed.

3. Emergency System Equipment:

a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.

b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.

4. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".

5. Use field-painted floor markings, floor marking tape, or warning labels to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.

6. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.

    a. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.

7. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.

8. Use warning labels to identify electrical hazards for equipment, compartments, and enclosures containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

B. Identification for Conductors and Cables:

1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.

2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:

    a. At each source and load connection.

C. Identification for Boxes:

1. Use voltage markers to identify highest voltage present.

2. Use voltage markers or color coded boxes to identify systems other than normal power system.

    a. Color-Coded Boxes: Field-painted per the same color code used for raceways.

D. Identification for Devices:

1. Wiring Device and Wallplate Finishes: Comply with Section 26 27 26.

2. Use identification label to identify fire alarm system devices.

3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.

a. For receptacles in public areas or in areas as directed by Architect, provide identification on inside surface of wallplate.

4. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.

2.2 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:

1. Materials:

a. Indoor Clean, Dry Locations: Use plastic nameplates.

b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.

2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.

3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser- etched text.

4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.

5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:

1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.

2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:

1. Minimum Size: 1 inch by 2.5 inches.

2. Legend:

a. System designation where applicable:

1) Emergency Power System: Identify with text "EMERGENCY".

2) Fire Alarm System: Identify with text "FIRE ALARM".

b. Equipment designation or other approved description.

3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height:

a. System Designation: 1 inch.

b. Equipment Designation: 1/2 inch.

5. Color:

a. Normal Power System: White text on black background.

D. Format for Receptacle Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.

2. Legend: Power source and circuit number or other designation indicated.

3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height: 3/16 inch.

5. Color: Black text on clear background.

E. Format for Control Device Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.

2. Legend: Load controlled or other designation indicated.

3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height: 3/16 inch.

5. Color: Black text on clear background.

F. Format for Fire Alarm Device Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.

2. Legend: Designation indicated and device zone or address.

3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height: 3/16 inch.

5. Color: Red text on white background.

2.3 WIRE AND CABLE MARKERS

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap- around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

C. Legend: Power source and circuit number or other designation indicated.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

E. Minimum Text Height: 1/8 inch.

F. Color: Black text on white background unless otherwise indicated.

2.4 VOLTAGE MARKERS

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

C. Minimum Size:

1. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.

2. Markers for Junction Boxes: 1/2 by 2 1/4 inches.

D. Legend:

1. Markers for Voltage Identification: Highest voltage present.

2. Markers for System Identification:

a. Emergency Power System: Text "EMERGENCY".

E. Color: Black text on orange background unless otherwise indicated.

2.5 UNDERGROUND WARNING TAPE

A. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.

B. Non-detectable Type Tape: 6 inches wide, with minimum thickness of 4 mil.

C. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.

D. Legend: Type of service, continuously repeated over full length of tape.

E. Color:

1. Tape for Buried Power Lines: Black text on red background.

2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.6 FLOOR MARKING TAPE

A. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches wide, with alternating black and white stripes.

2.7 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:

1. Materials:

2. Minimum Size: 7 by 10 inches unless otherwise indicated.

C. Warning Labels:

1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.

2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.

3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:

1. Surface-Mounted Equipment: Enclosure front.

2. Flush-Mounted Equipment: Inside of equipment door.

3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.

4. Elevated Equipment: Legible from the floor or working platform.

5. Branch Devices: Adjacent to device.

6. Interior Components: Legible from the point of access.

7. Boxes: Outside face of cover.

8. Conductors and Cables: Legible from the point of access.

9. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.

G. Mark all handwritten text, where permitted, to be neat and legible.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

SECTION 26 09 23

LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Occupancy sensors.

B. Outdoor motion sensors.

C. Time switches.

D. Outdoor photo controls.

E. Daylighting controls.

1.3 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 37 - Boxes.

C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

D. Section 26 27 26 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, fan speed controllers, and wall plates.

E. Section 26 51 00 - Interior Lighting.

1.4 REFERENCE STANDARDS

A. ANSI C136.10 - American National Standard for Roadway and Area Lighting Equipment - Locking-Type Photocontrol Devices and Mating Receptacles - Physical and Electrical Interchangeability and Testing; 2010.

B. ANSI C136.24 - American National Standard for Roadway and Area Lighting Equipment - Nonlocking (Button) Type Photocontrols; 2004 (R2010).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.

F. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Fluorescent Ballasts; National Electrical Manufacturers Association; 2011.

G. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 773 - Plug-in Locking Type Photocontrols for Use with Area Lighting; Current Edition, Including All Revisions.

I. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.

J. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

K. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.

2. Coordinate the placement of wall switch occupancy sensors with actual installed door swings.

3. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.

4. Coordinate the placement of photo sensors for daylighting controls with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.

5. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:

1. Do not install lighting control devices until final surface finishes and painting are complete.

1.6 SUBMITTALS

A. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.

1. Occupancy Sensors: Include detailed motion detection coverage range diagrams.

B. Shop Drawings:

1. Occupancy Sensors: Provide lighting plan indicating location, model number, and orientation of each occupancy sensor and associated system component.

2. Daylighting Controls: Provide lighting plan indicating location, model number, and orientation of each photo sensor and associated system component.

C. Samples:

1. Occupancy Sensors: One for each type and color specified.

D. Field Quality Control Reports.

E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: Include detailed information on device programming and setup.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.

H. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.9 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

A. See Section 01 77 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for all occupancy sensors.

PART 2 - PRODUCTS

2.1 ALL LIGHTING CONTROL DEVICES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

2.2 OCCUPANCY SENSORS

A. Manufacturers:

1. Lutron Electronics Company, Inc: www.lutron.com, or approved equal.

B. All Occupancy Sensors:

1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.

2. Sensor Technology:

a. Passive Infrared (PIR) Occupancy Sensors: Designed to detect occupancy by sensing movement of thermal energy between zones.

b. Ultrasonic Occupancy Sensors: Designed to detect occupancy by sensing frequency shifts in emitted and reflected inaudible sound waves.

c. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.

3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.

4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.

5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.

6. Passive Infrared Lens Field of View: Field customizable by addition of factory masking material, adjustment of integral blinders, or similar means to block motion detection in selected areas.

7. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.

8. Sensitivity: Field adjustable.

9. Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.

10. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.

C. Wall Switch Occupancy Sensors:

1. All Wall Switch Occupancy Sensors:

a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.

b. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.

2. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet.

D. Ceiling Mounted Occupancy Sensors:

1. All Ceiling Mounted Occupancy Sensors:

a. Description: Low profile occupancy sensors designed for ceiling installation.

b. Unless otherwise indicated or required to control the load indicated on the drawings, provide low voltage units, for use with separate compatible accessory power packs.

c. Provide field selectable setting for disabling LED motion detector visual indicator.

d. Occupancy sensor to be field selectable as either manual-on/automatic-off or automatic on/off.

2. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:

a. Standard Range Sensors: Capable of detecting motion within an area of 450 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.

b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.

E. Directional Occupancy Sensors:

1. All Directional Occupancy Sensors: Designed for wall or ceiling mounting, with integral swivel for field adjustment of motion detection coverage.

a. Unless otherwise indicated or required to control the load indicated on the drawings, provide low voltage units, for use with separate compatible accessory power packs.

2. Passive Infrared/Ultrasonic Dual Technology Directional Occupancy Sensors: Capable of detecting motion within a distance of 40 feet at a mounting height of 10 feet.

F. Power Packs for Low Voltage Occupancy Sensors:

1. Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.

2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on the drawings.

3. Input Supply Voltage: Dual rated for 120/277 V ac.

G. Power Packs for Wireless Occupancy Sensors:

1. Description: Plenum rated, self-contained relay compatible with specified wireless occupancy sensors for switching of line voltage loads.

2. Input Supply Voltage: Dual rated for 120/277 V ac.

2.3 OUTDOOR MOTION SENSORS

A. Description: Factory-assembled wet location listed device suitable for wall or ceiling/eave mounting, with integral swivel for field adjustment of coverage, capable of detecting motion for automatic control of load indicated.

B. Sensor Technology: Passive Infrared (PIR) designed to detect occupancy by sensing movement of thermal energy between zones.

C. Operation: Unless otherwise indicated, motion sensor to turn load on when motion is detected and to turn load off when no motion is detected during an adjustable turn-off delay time interval.

D. Turn-Off Delay: Field adjustable, with time delay settings available up to 15 minutes.

E. Integral Photocell: For dusk to dawn operation.

F. Manual Override: Activated by switching power off to unit and then back on.

G. Load Rating: 1,000 W incandescent and fluorescent load at 120 V ac.

H. Coverage: Capable of detecting motion within a distance of 50 feet at a mounting height of 8 feet, with a field of view of 270 degrees.

2.4 OUTDOOR PHOTO CONTROLS

A. Locking Receptacle-Mounted Outdoor Photo Controls

1. Description: Plug-in locking type photo control unit complying with ANSI C136.10 for mounting on a compatible receptacle, listed and labeled as complying with UL 773.

2. Housing: Weatherproof, impact resistant UV stabilized polypropylene, color to be selected.

3. Photo Sensor: Cadmium sulfide.

4. Light Level Activation: 1 to 3 footcandles turn-on and 1.5 to 1 turn-off to turn-on ratio with instant turn-on and delayed turn-off.

5. Voltage: As required to control the load indicated on the drawings.

6. Failure Mode: Fails to the on position.

7. Load Rating: As required to control the load indicated on the drawings.

8. Surge Protection: 160 joule metal oxide varistor.

B. Button Type Outdoor Photo Controls

1. Description: Direct-wired photo control unit complying with ANSI C136.24 with weatherproof gasketed wall plate where required or indicated, listed and labeled as complying with UL 773A.

2. Housing: Weather resistant polycarbonate.

3. Photo Sensor: Cadmium sulfide.

4. Light Level Activation: 1 to 3 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.

5. Voltage: As required to control the load indicated on the drawings.

6. Failure Mode: Fails to the on position.

7. Load Rating: As required to control the load indicated on the drawings.

2.5 DAYLIGHTING CONTROLS

A. Manufacturers:

1. Lutron Electronics Company, Inc: www.lutron.com, or approved equal.

B. System Description: Control system consisting of photo sensors and compatible control modules and power packs, contactors, or relays as required for automatic control of load indicated according to available natural light; capable of integrating with occupancy sensors and manual override controls.

C. Daylighting Control Photo Sensors: Low voltage class 2 photo sensor units with output signal proportional to the measured light level and provision for zero or offset based signal.

1. Sensor Type: Filtered silicon photo diode.

2. Sensor Range:

a. Indoor Photo Sensors: 5 to 100 footcandles.

b. Outdoor Photo Sensors: 5 to 250 footcandles.

c. Atrium Photo Sensors: 200 to 2,500 footcandles.

d. Skylight Photo Sensors: 1,000 to 6,000 footcandles.

3. Finish: White unless otherwise indicated.

4. Wireless Daylighting Control Photo Sensors:

a. RF Range: 30 feet through typical construction materials.

b. Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Limits: Comply with FCC requirements of CFR, Title 47, Part 15, for Class B application.

c. Power: Battery-operated with minimum ten-year battery life.

D. Dimming Photo Sensors: Photo sensor units with integral controller compatible with specified dimming ballasts, for direct continuous dimming of up to 50 ballasts.

E. Daylighting Control Switching Modules for Low Voltage Sensors: Low voltage class 2 control unit compatible with specified photo sensors, for switching of compatible power packs, contactors, or relays in response to changes in measured light levels according to selected settings.

1. Operation: Unless otherwise indicated, load to be turned on when light level is below selected low set point and load to be turned off when light level is above selected high set point, with a no switching dead band between set points to prevent unwanted cycling.

2. Input Delay: To prevent unwanted cycling due to intermittent light level fluctuations.

3. Control Capability:

F. Daylighting Control Switching Modules for Wireless Sensors:

1. Description: Plenum rated, self-contained relay compatible with specified wireless photo sensors for switching of line voltage loads in response to changes in measured light levels according to selected settings.

2. Operation: Unless otherwise indicated, load to be turned on when light level is below selected low set point and load to be turned off when light level is above selected

3. high set point, with a no switching dead band between set points to prevent unwanted cycling.

4. Input Delay: To prevent unwanted cycling due to intermittent light level fluctuations.

5. Control Capability: Capable of controlling one programmable channel.

6. Input Supply Voltage: Dual rated for 120/277 V ac.

7. Load Rating: As required to control the load indicated on the drawings.

G. Daylighting Control Dimming Modules for Low Voltage Sensors: Low voltage class 2 control unit compatible with specified photo sensors and with specified dimming ballasts, for both continuous dimming of compatible dimming ballasts and switching of compatible power packs, contactors, or relays in response to changes in measured light levels according to selected settings.

1. Operation: Unless otherwise indicated, specified load to be continuously brightened as not enough daylight becomes available and continuously dimmed as enough daylight becomes available.

2. Control Capability: Capable of controlling up to three separately programmable channels, with up to 50 ballasts per channel.

3. Dimming and Fade Rates: Adjustable from 5 to 60 seconds.

4. Cut-Off Delay: Selectable and adjustable from 0 to 20 minutes.

H. Daylighting Control Dimming Modules for Wireless Sensors:

1. Description: Plenum rated control unit compatible with specified wireless photo sensors and with specified dimming ballasts, for continuous dimming of compatible dimming ballasts in response to changes in measured light levels according to selected settings.

2. Operation: Unless otherwise indicated, specified load to be continuously brightened as not enough daylight becomes available and continuously dimmed as enough daylight becomes available.

3. Load to be turned off when available daylight is sufficient to fully dim the load, after the selected time delay.

4. Control Capability: Capable of controlling up to 32 ballasts with up to two separately programmable daylighting zones.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.

F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.

G. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0537 as required for installation of lighting control devices provided under this section.

1. Mounting Heights: Unless otherwise indicated, as follows:

a. Wall Switch Occupancy Sensors: 48 inches above finished floor.

2. Orient outlet boxes for vertical installation of lighting control devices unless otherwise indicated.

3. Locate wall switch occupancy sensors on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.

C. Install lighting control devices in accordance with manufacturer's instructions.

D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

E. Install lighting control devices plumb and level, and held securely in place.

F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 27 26.

G. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

H. Occupancy Sensor Locations:

1. Location Adjustments: Do not make adjustments to locations without obtaining approval from the Architect.

2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.

I. Outdoor Photo Control Locations:

1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.

2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.

J. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.

K. Daylighting Control Photo Sensor Locations:

1. Location Adjustments: Do not make adjustments to locations without obtaining approval from the Architect.

2. Unless otherwise indicated, locate photo sensors for closed loop systems to accurately measure the light level controlled at the designated task location, while minimizing the measured amount of direct light from natural or artificial sources such as windows or pendant luminaires.

3. Unless otherwise indicated, locate photo sensors for open loop systems to accurately measure the level of daylight coming into the space, while minimizing the measured amount of lighting from artificial sources.

L. Lamp Burn-In: Operate lamps at full output for minimum of 100 hours or prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.

M. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

N. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.

3.4 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each lighting control device for damage and defects.

C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.

D. Test outdoor photo controls to verify proper operation, including time delays where applicable.

E. Test daylighting controls to verify proper operation, including light level measurements and time delays where applicable. Record test results in written report to be included with submittals.

F. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.5 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.

C. Adjust position of directional occupancy sensors and outdoor motion sensors to achieve optimal coverage as required.

D. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.

E. Adjust daylighting controls under optimum lighting conditions after all room finishes, furniture, and window treatments have been installed to achieve desired operation as indicated or as directed by Architect. Record settings in written report to be included with submittals. Readjust controls calibrated prior to installation of final room finishes, furniture, and window treatments that do not function properly as determined by Architect.

3.6 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.7 COMMISSIONING

A. See Section 01 9113 for commissioning requirements.

3.8 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of lighting control devices to Architect, and correct deficiencies or make adjustments as directed.

B. Training: Train's personnel on operation, adjustment, programming, and maintenance of lighting control devices.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

2. Provide minimum of two hours of training.

3. Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed lighting control devices.

4. Location: At project site.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Power distribution panelboards.

B. Lighting and appliance panelboards.

C. Overcurrent protective devices for panelboards.

1.3 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 53 - Identification for Electrical Systems: Identification of products and requirements.

1.4 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Federal Specification; Revision D, 2006.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

C. NECA 407 - Standard for Installing and Maintaining Panelboards; National Electrical Contractors Association; 2009.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.

E. NEMA PB 1 - Panelboards; National Electrical Manufacturers Association; 2011.

F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; National Electrical Manufacturers Association; 2007.

G. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

H. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 67 - Panelboards; Current Edition, Including All Revisions.

L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

M. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.

4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.6 SUBMITTALS

A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.

C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.

2. Panelboard Keys: Two of each different key.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

1.9 FIELD CONDITIONS

A. Maintain ambient temperature within the following limits during and after installation of panelboards:

1. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Eaton Corporation; Cutler-Hammer Products: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

D. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.2 ALL PANELBOARDS

A. Provide products listed and labeled by Underwriters Laboratories Inc. as suitable for the purpose indicated.

B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:

1. Altitude: Less than 6,600 feet.

2. Ambient Temperature:

a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

C. Short Circuit Current Rating:

1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.

D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.

E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.

F. Bussing: Sized in accordance with UL 67 temperature rise requirements.

1. Provide 200 percent rated neutral bus and lugs where indicated, where oversized neutral conductors are provided, or where panelboards are fed from K-rated transformers.

2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.

G. Conductor Terminations: Suitable for use with the conductors to be installed.

H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.

1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:

2. Boxes: Galvanized steel unless otherwise indicated.

a. Provide wiring gutters sized to accommodate the conductors to be installed.

3. Fronts:

a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.

b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.

4. Lockable Doors: All locks keyed alike unless otherwise indicated.

I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

2.3 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:

1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

2. Main and Neutral Lug Type: Mechanical.

C. Bussing:

1. Phase and Neutral Bus Material: Aluminum.

2. Ground Bus Material: Aluminum.

D. Circuit Breakers:

1. Provide bolt-on type.

2. Provide thermal magnetic circuit breakers unless otherwise indicated.

E. Enclosures:

1. Provide surface-mounted enclosures unless otherwise indicated.

2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.

3. Provide clear plastic circuit directory holder mounted on inside of door.

2.4 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:

1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

2. Main and Neutral Lug Type: Mechanical.

C. Bussing:

1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.

2. Phase and Neutral Bus Material: Copper.

3. Ground Bus Material: Copper.

D. Circuit Breakers: Thermal magnetic bolt-on type.

E. Enclosures:

1. Provide surface-mounted or flush-mounted enclosures as indicated.

2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.

3. Provide clear plastic circuit directory holder mounted on inside of door.

2.5 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:

1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

2. Interrupting Capacity:

a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:

1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.

b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.

3. Conductor Terminations:

a. Provide mechanical lugs unless otherwise indicated.

b. Lug Material: Copper, suitable for terminating copper conductors only.

4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.

a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.

5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

6. Provide the following circuit breaker types where indicated:

a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.

7. Do not use handle ties in lieu of multi-pole circuit breakers.

8. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.

2.6 SOURCE QUALITY CONTROL

A. Factory test panelboards according to NEMA PB 1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.

B. Verify that mounting surfaces are ready to receive panelboards.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install panelboards securely, in a neat and workmanlike manner in accordance with NECA 1 (general workmanship), NECA 407 (panelboards), and NEMA PB 1.1.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required supports in accordance with Section 26 0529.

E. Install panelboards plumb.

F. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.

G. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.

H. Mount floor-mounted power distribution panelboards on properly sized 3 inch high concrete pad constructed in accordance with Section 03 3000.

I. Provide minimum of six spare 1 inch trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling and below floor.

J. Provide grounding and bonding in accordance with Section 26 0526.

1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.

K. Install all field-installed branch devices, components, and accessories.

L. Multi-Wire Branch Circuits: Group grounded and ungrounded conductors together in the panelboard as required by NFPA 70.

M. Provide filler plates to cover unused spaces in panelboards.

N. Provide circuit breaker lock-on devices to prevent unauthorized personnel from de- energizing essential loads where indicated. Also provide for the following:

1. Emergency and night lighting circuits.

2. Fire detection and alarm circuits.

3. Communications equipment circuits.

4. Intrusion detection and access control system circuits.

5. Video surveillance system circuits.

O. Identify panelboards in accordance with Section 26 0553.

3.3 FIELD QUALITY CONTROL

A. Perform inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA STD ATS, Section 7.6.1.1 for all main circuit breakers and circuit breakers larger than amperes. Tests listed as optional are not required.

D. Test GFCI circuit breakers to verify proper operation.

E. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.4 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

3.5 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 27 17

EQUIPMENT WIRING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Electrical connections to equipment.

1.3 RELATED REQUIREMENTS

A. Section 26 0534 - Conduit.

B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables (600 V and Less).

C. Section 26 0537 - Boxes.

D. Section 26 2726 - Wiring Devices.

1.4 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association.

B. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

2. Determine connection locations and requirements.

B. Sequencing:

1. Install rough-in of electrical connections before installation of equipment is required.

2. Make electrical connections before required start-up of equipment.

1.6 SUBMITTALS

A. Product Data: Provide wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.

1. Colors: Conform to NEMA WD 1.

2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

B. Wiring Devices: As specified in Section 26 2726.

C. Wire and Cable: As specified in Section 26 0519.

D. Boxes: As specified in Section 26 0537.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquid tight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Wall switches.

B. Wall dimmers.

C. Receptacles.

D. Wall plates.

E. Floor box service fittings.

F. Access floor boxes.

1.3 RELATED REQUIREMENTS

A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.

B. Section 26 0526 - Grounding and Bonding for Electrical Systems.

C. Section 26 0537 - Boxes.

D. Section 26 0553 - Identification for Electrical Systems: Identification of products and requirements.

E. Section 26 0923 - Lighting Control Devices: Devices for automatic control of lighting, including occupancy sensors, in-wall time switches, and in-wall interval timers.

F. Section 26 2717 - Equipment Wiring: Cords and plugs for equipment.

1.4 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association.

D. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association.

E. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association.

F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

H. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

I. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

J. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

K. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.

2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.

3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.

4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:

1.6 SUBMITTALS

A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Operation and Maintenance Data:

1. Wall Dimmers: Include information on operation and setting of presets.

2. GFI Receptacles: Include information on status indicators and testing procedures and intervals.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Keys for Locking Switches: Two of each type.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFI receptacles with specified weatherproof covers for all receptacles installed outdoors or in damp or wet locations.

D. Provide tamper resistant receptacles for all receptacles installed in areas for children.

E. Provide GFI protection for all receptacles installed within 6 feet of sinks.

F. Provide GFI protection for all receptacles installed in kitchens.

G. Provide GFI protection for all receptacles serving electric drinking fountains.

H. Unless noted otherwise, do not use combination switch/receptacle devices.

I. For flush floor service fittings, use tile rings for installations in tile floors.

2.2 ALL WIRING DEVICES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

B. Project standard is Decora style devices and face plates by Leviton. Coordinate finished color with project architect for each space.

C. Finishes:

1. All Wiring Devices: Color selection by architect.

2. Flush Floor Box Service Fittings: Gray wiring devices with aluminum cover and ring/flange.

2.3 WALL SWITCHES

A. All Wall Switches: AC only, quiet operating, general-use rocker type switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

C. Locking Wall Switches: Industrial specification grade, 20 A, 120/277 V with lever type keyed switch actuator and maintained contacts; all switches keyed alike; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.4 WALL DIMMERS

A. All Wall Dimmers: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

2.5 RECEPTACLES

A. All Receptacles: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.

2. NEMA configurations specified are according to NEMA WD 6.

3. Hospital Grade Receptacles: Listed as complying with UL 498 Supplement SD, with green dot hospital grade mark on device face.

B. Convenience Receptacles:

1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

2. Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R,, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.

3. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R,, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.

4. Tamper Resistant and Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R,, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.

C. GFI Receptacles:

1. All GFI Receptacles: Provide with feed-through protection, light to indicate ground fault tripped condition and loss of protection, and list as complying with UL 943, class A.

a. Provide test and reset buttons of same color as device.

2. Standard GFI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.

3. Weather Resistant GFI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

4. Tamper Resistant and Weather Resistant GFI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

D. Locking Receptacles: Industrial specification grade, configuration as indicated on the drawings.

1. Standard Locking Convenience Receptacles: Single, 20A, 125V, NEMA L5-20R.

2.6 WALL PLATES

A. All Wall Plates: Comply with UL 514D.

1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.

2. Size: Standard; to match box or mud ring size.

3. Screws: Metal with slotted heads finished to match wall plate finish.

B. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.

C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

D. Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.

E. Pre-marked Wall Plates: Factory labeled as indicated; hot stamped for nylon wall plates and engraved for metal wall plates.

F. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

G. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected.

2.7 FLOOR BOX SERVICE FITTINGS

A. Description: Service fittings compatible with floor boxes provided under Section 26 0537 with all components, adapters, and trims required for complete installation.

B. Flush Floor Service Fittings:

1. Single Service Flush Convenience Receptacles:

a. Cover: Rectangular.

b. Configuration: One standard convenience duplex receptacle(s) with duplex flap opening(s).

2. Single Service Flush Communications Outlets:

a. Cover: Rectangular.

b. Configuration: To accommodate required connectivity.

c. Voice and Data Jacks: As specified in Section 27 1005.

3. Single Service Flush Furniture Feed:

a. Cover: Rectangular.

b. Configuration: One 2-1/8 inch by 3/4 inch combination threaded opening(s).

4. Dual Service Flush Combination Outlets:

a. Cover: Rectangular.

b. Configuration:

1) Power: One standard convenience duplex receptacle(s) with duplex flap opening(s).

2) Communications: Manufacturer's standard to provided required connectivity.

3) Voice and Data Jacks: As specified in Section 27 1005.

5. Dual Service Flush Furniture Feed:

a. Cover: Rectangular.

b. Configuration:

1) Power: One 2-1/8 inch by 3/4 inch combination threaded opening(s).

2) Communications: One 2-1/8 inch by 1 inch combination threaded opening(s).

6. Accessories:

a. Tile Rings: Finish to match covers; configuration as required to accommodate specified covers.

b. Carpet Flanges: Finish to match covers; configuration as required to accommodate specified covers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that final surface finishes are complete, including painting.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0537 as required for installation of wiring devices provided under this section.

1. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.

2. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.

3. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Provide GFI receptacles with integral GFI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

J. Install wall switches with OFF position down.

K. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

L. Do not share neutral conductor on branch circuits utilizing wall dimmers.

M. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

N. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

O. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.4 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect each wiring device for damage and defects.

C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

D. Test each receptacle to verify operation and proper polarity.

E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

F. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Adjust presets for wall dimmers according to manufacturer's instructions as directed by Architect.

3.6 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 26 51 00

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Interior luminaires.

B. Exit signs.

C. Ballasts.

D. Lamps.

E. Luminaire accessories.

1.3 RELATED REQUIREMENTS

A. Section 26 0537 - Boxes.

B. Section 26 0553 - Identification for Electrical Systems: Identification of products and requirements.

C. Section 26 0923 - Lighting Control Devices: Automatic controls for lighting including occupancy sensors, outdoor motion sensors, time switches, outdoor photo controls, and daylighting controls.

D. Section 26 0943 - Network Lighting Controls - Lutron.

1. Includes fluorescent dimming ballasts.

E. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.

1.4 REFERENCE STANDARDS

A. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple-Supply Type).

B. ANSI C82.11 - American National Standard for Lamp Ballasts - High Frequency Fluorescent Lamp Ballasts – Supplements.

C. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits.

D. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association.

F. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association.

G. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; National Electrical Contractors Association.

H. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Fluorescent Ballasts; National Electrical Manufacturers Association.

I. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; National Electrical Manufacturers Association.

J. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association.

L. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

M. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.

N. UL 1598 - Luminaires; Current Edition, Including All Revisions.

O. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.

2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.

3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.

4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.6 SUBMITTALS

A. Shop Drawings:

1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

2. Provide photometric calculations where luminaires are proposed for substitution for approval by engineer of record..

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

1. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IESNA LM-63 standard format upon request.

2. Ballasts: Include wiring diagrams and list of compatible lamp configurations.

3. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.

C. Samples:

1. Provide one sample(s) of each custom luminaire.

D. Certificates for Dimming Ballasts: Manufacturer's documentation of compatibility with dimming controls to be installed.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Lenses and Louvers: Two percent of total quantity installed for each type, but not less than one of each type.

3. Extra Lamps: Ten percent of total quantity installed for each type, but not less than two (2) of each type.

4. Extra Ballasts: Two percent of total quantity installed for each type, but not less than one of each type.

1.7 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect them from damage until ready for installation.

1.9 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

A. Provide two (2) year manufacturer warranty for all linear fluorescent ballasts.

PART 2 - PRODUCTS

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:

1. Ceiling Compatibility: Comply with NEMA LE 4.

2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.

H. Fluorescent Luminaires:

1. Provide ballast disconnecting means complying with NFPA 70 where required.

2. Fluorescent Luminaires Controlled by Occupancy Sensors: Provide programmed start ballasts.

3. Fluorescent Luminaires Controlled by Dual-Level Switching: Provide with two (2) ballasts.

a. Luminaires with Two (2) Lamps: Each ballast controls one (1) lamp.

b. Luminaires with Three (3) Lamps: One (1) ballast controls two (2) outer lamps and one (1) ballast controls inner lamp.

I. LED Luminaires: Listed and labeled as complying with UL 8750.

2.3 EXIT SIGNS

A. All Exit Signs: Internally illuminated with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

1. Number of Faces: Single or double as indicated or as required for the installed location.

2. Directional Arrows: As indicated or as required for the installed location.

2.4 BALLASTS

A. All Ballasts:

1. Provide ballasts containing no polychlorinated biphenyls (PCBs).

2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

B. Fluorescent Ballasts:

1. All Fluorescent Ballasts: Unless otherwise indicated, provide high frequency electronic ballasts complying with ANSI C82.11 and listed and labeled as complying with UL 935.

a. Input Voltage: Suitable for operation at voltage of connected source, with variation tolerance of plus or minus 10 percent.

b. Total Harmonic Distortion: Not greater than 20 percent.

c. Power Factor: Not less than 0.95.

d. Thermal Protection: Listed and labeled as UL Class P, with automatic reset for integral thermal protectors.

e. Sound Rating: Class A, suitable for average ambient noise level of 20 to 24 decibels.

f. Lamp Compatibility: Specifically designed for use with the specified lamp, with no visible flicker.

g. Lamp Operating Frequency: Greater than 20 kHz, except as specified below.

h. Lamp Current Crest Factor: Not greater than 1.7.

i. Provide automatic restart capability to restart replaced lamp(s) without requiring resetting of power.

j. Provide end of lamp life automatic shut down circuitry for T5 and smaller diameter lamp ballasts.

k. Surge Tolerance: Capable of withstanding characteristic surges according to IEEE C62.41.2, location category A.

l. Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Limits: Comply with FCC requirements of CFR, Title 47, Part 18, for Class A, non-consumer application.

m. Ballast Marking: Include wiring diagrams with lamp connections.

2. Dimming Fluorescent Ballasts - Network-Connected: Comply with Section 26 0943.

2.5 LAMPS

A. Manufacturers:

1. General Electric Company/GE Lighting; : www.gelighting.com.

2. Osram Sylvania; : www.sylvania.com.

3. Philips Lighting Company; : www.lighting.philips.com.

B. All Lamps:

1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.

2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.

3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.

4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.

5. T5 Linear Fluorescent Lamps:

   a. Correlated Color Temperature (CCT): 3,500 K unless otherwise indicated.

   b. Color Rendering Index (CRI): Not less than 80.

   c. Average Rated Life: Not less than 20,000 hours for an operating cycle of three (3) hours per start.

2.6 ACCESSORIES

A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.

B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field- painted as directed.

C. Tube Guards for Linear Fluorescent Lamps: Provide clear virgin polycarbonate sleeves with endcaps where indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

B. Verify that suitable support frames are installed where required.

C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0537 as required for installation of luminaires provided under this section.

B. Install products according to manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 1 (general workmanship), NECA 500 (commercial lighting), and NECA 502 (industrial lighting).

D. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

E. Suspended Ceiling Mounted Luminaires:

1. Do not use ceiling tiles to bear weight of luminaires.

2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.

3. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.

4. Secure pendant-mounted luminaires to building structure.

5. Secure lay-in luminaires to ceiling support channels using listed safety clips at four (4) corners.

6. In addition to ceiling support wires, provide two (2) galvanized steel safety wire(s), minimum 12 gage, connected from opposing corners of each recessed luminaire to building structure.

7. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

F. Recessed Luminaires:

1. Install trims tight to mounting surface with no visible light leakage.

2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.

3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.

G. Suspended Luminaires:

1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.

2. Provide minimum of two (2) supports for each luminaire equal to or exceeding 4 feet in length, with no more than 4 feet between supports.

3. Install canopies tight to mounting surface.

4. Unless otherwise indicated, support pendants from swivel hangers.

H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

I. Install accessories furnished with each luminaire.

J. Bond products and metal accessories to branch circuit equipment grounding conductor.

K. Fluorescent Luminaires Controlled by Dual-Level Switching: Connect such that each switch controls the same corresponding lamps in each luminaire.

L. Exit Signs.

M. Install lamps in each luminaire.

3.4 FIELD QUALITY CONTROL

A. Inspect each product for damage and defects.

B. Operate each luminaire after installation and connection to verify proper operation.

C. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.5 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.6 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.7 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.

B. Just prior to Substantial Completion, replace all lamps that have failed.

3.8 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 27 05 00

BASIC COMMUNICATIONS SYSTEMS REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Basic Communications Systems Requirements specifically applicable to Division 27 sections, in addition to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 REFERENCES

A. CCR California Code of Regulation

B. CBC California Building Code

C. CFC California Fire Code

D. CEC California Electric Code

E. CMC California Mechanical Code

F. CPC California Plumbing Code

G. California Title 24 - Building Energy Efficiency Standards

H. SCAQMD Southern California Air Quality Management Division

1.3 SCOPE OF WORK

A. This Specification and the accompanying drawings govern the work involved in furnishing, installing, testing and placing into satisfactory operation the Communications Systems as shown on the drawings and specified herein.

B. Each Contractor shall provide all new materials as indicated in the schedules on the drawings, and/or in these specifications, and all items required to make the portion of the Communications Systems a finished and working system.

1. Description of Systems include but are not limited to the following: Complete Structured Cabling System including, but not limited to:

a. Voice and data horizontal cabling and terminations.

b. Information outlets (IOs) including faceplates, jacks and labeling.

c. Cabling pathways.

d. Grounding and Bonding

e. Testing

2. Complete Audio/Visual Systems.

3. Removal/demolition work and/or relocation and reuse of existing systems and equipment.

4. Low Voltage Communications Wiring (less than +120VAC) as specified and required for proper system control and communications.

5. All associated electrical backboxes, conduit, miscellaneous cabling, and power supplies required for proper system installation.

6. Firestopping of penetrations as described in Section 27 05 03.

1.4 WORK SEQUENCE

A. All construction work that will produce excessive noise levels and interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during non-occupied hours. The Owner shall reserve the right to set policy as to when restricted construction hours will be required.

1.5 DIVISION OF WORK BETWEEN ELECTRICAL AND COMMUNICATIONS CONTRACTORS

A. Division of work is the responsibility of the Prime Contractor. Any scope of work described in the contract document shall be sufficient for including said requirement in the project. The Prime Contractor shall be solely responsible for determining the appropriate subcontractor for the described scope. In no case shall the project be assessed an additional cost for scope that is described in the contract documents. The following division of responsibility is a guideline based on typical industry practice.

B. Definitions:

1. "Electrical Contractor" as referred to herein refers to the Contractors listed in Division 26 of this Specification.

2. "Technology Contractor" as referred to herein refers to the Contractors listed in Division 27 of this Specification.

3. Low Voltage Technology Wiring: The wiring (less than 120VAC) associated with the Technology Systems, used for analog and/or digital signals between equipment.

4. Telecommunications/Technology Rough-in: Relates specifically to the backboxes, necessary plaster rings and other miscellaneous hardware required for the installation and mounting of the telecommunications/technology outlet. Rough-in shall include conduit from the information outlet backbox to above the lay-in ceiling.

5. Where surface mounted backboxes are required, conduit shall be routed to above the lay-

in ceiling.

C. General:

1. The purpose of these specifications is to outline typical Electrical and Technology Contractor's work responsibilities as related to technology systems including telecommunications rough-in, audio/visual systems rough-in, conduit,[cable tray,] power wiring, and low voltage communications and technology wiring. The prime contractor is responsible for all divisions of work.

2. The exact wiring requirements for much of the equipment cannot be determined until the systems have been purchased and submittals are approved. Therefore, only known wiring, conduits, raceways, and electrical power as related to such items, is shown on the technology drawings. Other wiring, conduits, raceways, junction boxes, and electrical power not shown on the technology drawings but required for the successful operation of the systems shall be the responsibility of the Technology Contractor and included in the Contractor's bid.

3. Where the Electrical Contractor is required to install conduit, conduit sleeves and/or power connections in support of technology systems, the final installation shall not begin until a coordination meeting between the Electrical Contractor and the Technology Contractor has convened to determine the exact location and requirements of the installation.

4. Where the Electrical Contractor is required to install cable tray that will contain low voltage technology wiring, the installation shall not begin until the Technology Contractor has completed a coordination review of the cable tray shop drawing.

5. This Contractor shall establish electrical and technology utility elevations prior to fabrication and installation. The Technology Contractor shall cooperate with the Electrical Contractor and the determined elevations in accordance with the guidelines below. This Contractor shall coordinate utility elevations with other trades. When a conflict arises, priority shall be as follows:

    a. Lighting Fixtures

    b. Gravity Flow Piping, including Steam and Condensate

    c. Sheet Metal

    d. Electrical Busduct

    e. Sprinkler Piping and other Piping

    f. Conduit and Wireway

    g. Open Cabling

D. Electrical Contractor's Responsibility:

1. Assumes all responsibility for all required conduit and power to be provided by the Electrical Contractor.

2. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

E. Technology Contractor's Responsibility:

1. Assumes all responsibility for the low voltage technology wiring of all systems, including cable support where open cable is specified.

2. Assumes all responsibility for all required backboxes, conduit and power connections not specifically shown as being provided by the Electrical Contractor.

3. Responsible for providing the Electrical Contractor with the required grounding lugs or other hardware for each piece of technology equipment which is required to be bonded to the technology bonding system.

4. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.6 COORDINATION DRAWINGS

A. Definitions:

1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.

a. Mechanical trades shall include, but are not limited to, mechanical equipment, ductwork, fire protection systems, plumbing piping, medical gas systems, hydronic piping, steam and steam condensate piping, and any item that may impact coordination with other disciplines.

b. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" and larger, conduit racks, ceiling-mounted devices, and any item that may impact coordination with other disciplines.

c. Technology trades shall include, but are not limited to, technology equipment, racks, conduit 1.5" and larger, conduit racks, raceway, ceiling-mounted devices, and any item that may impact coordination with other disciplines.

d. Maintenance clearances and code-required dedicated space shall be included.

e. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.

2. Spaces with open/cloud ceiling architecture shall indicate the overhead utilities and locate

equipment as required to maintain clearance above lights. The intent for the installation is to maintain a maximum allowable vertical clearance and an organized/clean manner in the horizontal. Notify Architect/Engineer of the maximum clearance which can be maintained. Failure to comply will result in modifications with no cost to Owner.

a. In cloud ceiling architecture, when open cabling/wire and/or cable tray crosses gaps between ceiling clouds and/or walls, cabling is to transition to conduits to span the gaps in order to conceal cabling from below.

3. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.

B. Participation:

1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.

2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the[Mechanical Contractor].

a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.

C. Drawing Requirements:

1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.

a. Scale of drawings:

1) General plans: 1/4 Inch = 1 '-0" (minimum).

2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).

3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).

4) Sections of shafts and mechanical and electrical equipment rooms: 1/4-inch = 1-foot-0-inches
(1'-0") minimum.

5) Sections of congested areas: 1/2 Inch = 1-foot-0-inches (1'-0") minimum.

2. Ductwork layout drawings shall be the baseline system for other components. Ductwork layout drawings shall be modified to accommodate other components as the coordination

process progresses.

3. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.

4. The minimum quantity of drawings will be established at the first coordination meeting and sent to the A/E for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.

D. General:

1. Coordination drawing files shall be made available to the A/E and Owner's Representative. The A/E will only review identified conflicts and give an opinion, but will not perform as a coordinator.

2. A plotted set of coordination drawings shall be available at the project site.

3. Coordination drawings are not shop drawings and shall not be submitted as such.

4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.

5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.

6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.

7. The A/E reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.

8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the A/E.

9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.

a. Access to mechanical, electrical, technology, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.

b. Potential layout changes shall be made to avoid additional access panels.

c. Additional access panels shall not be allowed without written approval from the A/E at the coordination drawing stage.

d. Providing additional access panels shall be considered after other alternatives are

reviewed and discarded by the A/E and the Owner's Representative.

e. When additional access panels are required, they shall be provided without additional cost to the Owner.

f. Construction: Panels shall be at least 12 inches by 12 inches, and located to provide optimum access to equipment for maintenance and servicing.

10. Complete the coordination drawing process and obtain signoff of the drawings by all contractors prior to installing any of the components.

11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.

12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

1.7 QUALITY ASSURANCE

A. Telecommunications Structured Cabling System Standards:

1. All work and equipment shall conform to the most current ratified version of the following published standards unless otherwise indicated that draft standards are to be followed:

a. ANSI/NECA/BICSI 568 - Standard for Installing Commercial Building Telecommunications Cabling

b. ANSI/TIA-568-C.0 - Generic Telecommunications Cabling for Customer Premises

1) C.1 - Commercial Building Telecommunications Standard

2) C.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standard

3) C.3 - Optical Fiber Cabling Components Standard

4) C.4 - Broadband Coaxial Cabling and Components Standard

c. ANSI/TIA-569-C - Telecommunications Pathways and Spaces

d. ANSI/TIA-606-B - Administration Standard for Commercial Telecommunications Infrastructure

e. ANSI/TIA-607-B - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

f. ANSI/TIA-862-A - Building Automation Systems Cabling Standard

g. ANSI/TIA-1152 - Requirements for Field Test Instruments and Measurements for

Balanced Twisted-Pair Cabling

h. ANSI/TIA/EIA-598-C - Optical Fiber Cable Color Coding

i. NFPA 70 (NEC) - National Electrical Code (Current Edition)

j. UL 444 - Standard for Safety for Communications Cable

k. California Code of Regulation Title 24, Article E725

B. Refer to individual sections for additional Quality Assurance requirements.

C. Qualifications:

1. Only products of reputable manufacturers as determined by the Architect/Engineer will be acceptable.

2. The installing Contractor shall be certified by the manufacturer of the structured cabling system. Certification of Contractor shall have been in place for a minimum of one (1) year prior to bidding this project. Documentation of certification is required at the time of bid. Shop drawings will not be approved until proof of certification is submitted. Refer to the end of this specification section for certification documentation requirements.

3. Each Contractor and their subcontractors shall employ only workers who are skilled in their respective trades and fully trained. All workers involved in the termination of cabling shall be individually certified by the manufacturer.

4. The Contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size.

5. The Contractor shall own and maintain tools and equipment necessary for successful installation and testing of optical and copper structured cabling systems and have personnel adequately trained in the use of such tools and equipment.

6. The Contractor must have a BICSI RCDD (Registered Communications Distribution Designer) or CNet CNIDP (Certified Network Infrastructure Design Professional) on-staff serving as a project manager. Project shop drawings and test reports shall be stamped by the RCDD or CNIDP.

7. The Contractor shall obtain the services of a BICSI RCDD (Registered Communications Distribution Designer) or CNet CNIDP (Certified Network Infrastructure Design Professional) for the project. The RCDD or CNIDP shall perform the following tasks on the project:

a. Review contractor's submittals and stamp the submittals stating the submittals compliance with the contract documents.

b. Provide written and dated confirmation of an observation of the contractor's installation activities no less than every [2 weeks] [month] during the construction

period.

c. Provide a final written and dated confirmation of a final construction review prior to testing.

d. Review final testing of system and indication that the documented results or transmittal of the results stating the test results compliance with the contract documents.

8. The Contractor shall have certified BICSI installation technicians or CNet CNIT (Certified Network Infrastructure Technician) on staff to perform the following tasks on the project:

a. Act as the field superintendent or job foreman with the responsibility of monitoring the daily work of each technician.

b. Oversee all testing and termination of cabling.

9. The Contractor shall have certified BICSI Installer 2 or CNet CNCI (Certified Network Cabling Installer) on staff to perform the following tasks:

a. Installation and termination of copper cable.

b. Installation and termination of optical fiber.

10. A resume of qualification shall be submitted with the Contractor's bid indicating the following:

a. Documentation of certification of This Contractor by the proposed structured cabling system manufacturer as required at the end of this specification section.

b. A list of recently completed projects of similar type and size with contact names and telephone numbers for each.

c. A list of test equipment proposed for use in verifying the installed integrity of copper systems on the project.

d. A technical resume of experience for the Contractor's project manager and on-site installation supervisor assigned to this project.

e. Resume and certification of the RCDD or CNIDP for the project as required by the form at the end of this specification section.

f. Resume and certification of the BICSI installation technician or CNet CNIT for the project.

D. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the State of California Codes, Laws, Ordinances and other regulations having jurisdiction.

2. In the event there are no local codes having jurisdiction over this job, the current issue of the National Electrical Code shall be followed.

3. If there is a discrepancy between the codes and regulations having jurisdiction over this installation, and these specifications, Architect/Engineer shall determine the method or equipment used.

4. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time to follow this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.

5. Verify the installation environment prior to purchasing or installing any cable. Cable installed in a plenum environment shall be appropriately rated. Bring all discrepancies between the contract documents and installation conditions to the attention of the Architect/Engineer prior to purchase or installation.

6. All changes to the system made after the letting of the contract, in order to comply with the applicable codes or the requirements of the Inspector, shall be made by the Contractor without cost to the Owner.

E. Permits, Fees, Taxes, Inspections:

1. Procure all applicable permits and licenses.

2. Abide by all applicable laws, regulations, ordinances, and other rules of the State or Political Subdivision wherein the work is done, or as required by any duly constituted public authority.

3. Pay all applicable charges for such permits or licenses that may be required.

4. Pay all applicable fees and taxes imposed by the State, Municipal and/or other regulatory bodies.

5. Pay all charges arising out of required inspections due to codes, permits, licenses or as otherwise may be required by an authorized body.

6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized independent agency/consultant.

7. Pay any charges by the service provider related to the service or change in service to the project.

8. All equipment and materials shall be as approved or listed by the following (unless approval or listing is not applicable to an item by all acceptable manufacturers):

a. Factory Mutual

b. Underwriters' Laboratories, Inc.

F. Service Provider Requirements:

1. Secure from the telecommunications service provider all applicable requirements.

2. Comply with all service provider requirements.

3. The Owner shall make application for and pay for new telecommunications service equipment and installation. The Contractor shall coordinate schedule and requirements with the Owner and service provider.

G. Examination of Drawings:

1. The drawings for the technology systems work are diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment etc., and the approximate sizes of equipment.

2. Contractor shall determine the exact locations of equipment and the exact routing of cabling to best fit the layout of the job. Scaling of the drawings will not be sufficient or accurate for determining this layout. Where a specific route is required, such route will be indicated on the drawings.

3. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.

4. If an item is either shown on the drawings, called for in the specifications or required for proper operation of the system, it shall be considered sufficient for including same in this contract.

5. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specifications are completed as an aid to the Contractor but where discrepancies arise, the greater number shall govern.

6. Where words "provide", "install", or "furnish" are used on the drawings or in the specifications, it shall be taken to mean, to furnish, install and terminate completely ready for operation, the items mentioned.

H. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing AutoCAD MEP.

2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.

3. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by PBS. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.

4. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.

5. The drawings prepared by PBS for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.

6. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.

7. The information is provided to expedite the project and assist the Contractor with no guarantee by PBS as to the accuracy or correctness of the information provided. PBS accepts no responsibility or liability for the Contractor's use of these documents.

I. Field Measurements:

1. Before ordering any materials, this Contractor shall verify all pertinent dimensions at the job site and be responsible for their accuracy.

2. Field conditions that will result in telecommunications drops that exceed the length limitations identified in the contract documents shall be brought to the attention of the Architect/Engineer prior to installation. The cost of reworking cabling that is too long, that was not brought to the written attention of the Architect/Engineer will be borne entirely by the Contractor.

3. This Contractor shall provide the Architect/Engineer with written documentation of any cabling drops that will not be able to use the cable tray (where cable tray is available) due to the resulting cabling lengths. This documentation shall be submitted prior to installation and installation shall not commence until approved by the Architect/Engineer.

1.8 SUBMITTALS

A. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals list:

a. Referenced Specification

Section	Submittal Item
27 05 03	Through Penetration Firestopping
27 05 26	Communications Bonding
27 05 28	Interior Communications Pathways
27 05 43	Exterior Communications Pathways

27 05 53 Identification and Administration

27 11 00 Communication Equipment Rooms

27 15 00 Horizontal Cabling Requirements

27 17 10 Testing

27 53 13.13 Wireless Clock System

28 31 00 Fire Detection and Alarm

B. General Submittal Procedures: In addition to the provisions of Division 1, the following are required:

1. Transmittal: Each transmittal shall include the following:

a. Date

b. Project title and number

c. Contractor's name and address

d. Description of items submitted and relevant specification number

e. Notations of deviations from the contract documents

f. Other pertinent data

2. Submittal Cover Sheet: Each submittal shall include a cover sheet containing:

   a. Date

   b. Project title and number

   c. Architect/Engineer

   d. Contractor and subcontractors' names and addresses

   e. Supplier and manufacturer's names and addresses

   f. Description of item submitted (using project nomenclature) and relevant specification number

   g. Notations of deviations from the contract documents

   h. Other pertinent data

   i. Provide space for Contractor's review stamps

3. Composition:

   a. Submittals shall be submitted using specification sections and the project nomenclature for each item.

   b. Individual submittal packages shall be prepared for items in each specification section. All items within a single specification section shall be packaged together where possible. An individual submittal may contain items from multiple specifications sections if the items are intimately linked (e.g., pumps and motors).

   c. All sets shall contain an index of the items enclosed with a general topic description on the cover.

4. Content: Submittals shall include all fabrication, erection, layout, and setting drawings; manufacturers' standard drawings; schedules; descriptive literature, catalogs and brochures; performance and test data; wiring and control diagrams; dimensions; shipping and operating weights; shipping splits; service clearances; and all other drawings and descriptive data of materials of construction as may be required to show that the materials, equipment or systems and the location thereof conform to the requirements of the contract documents.

5. Contractor's Approval Stamp:

   a. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. The Contractor shall stamp, date and sign each submittal certifying it has been reviewed.

b. Unstamped submittals will be rejected.

c. The Contractor shall provide proof of RCDD or CNIDP review on the submittal.

d. The Contractor's review shall include, but not be limited to, verification of the following:

1) Only approved manufacturers are used.

2) Addenda items have been incorporated.

3) Catalog numbers and options match those specified.

4) Performance data matches that specified.

5) Electrical characteristics and loads match those specified.

6) Equipment connection locations, sizes, capacities, etc. have been coordinated with other affected trades.

7) Dimensions and service clearances are suitable for the intended location.

8) Equipment dimensions are coordinated with support steel, housekeeping pads, openings, etc.

9) Constructability issues are resolved (e.g., weights and dimensions are suitable for getting the item into the building and into place, sinks fit into countertops, etc.).

e. The Contractor shall review, stamp and approve all subcontractors' submittals as described above.

f. The Contractor's approval stamp is required on all submittals. Approval will indicate the Contractor's review of all material and a complete understanding of exactly what is to be furnished. Contractor shall clearly mark all deviations from the contract documents on all submittals. If deviations are not marked by the Contractor, then the item shall be required to meet all drawing and specification requirements.

6. Submittal Identification and Markings:

a. The Contractor shall clearly mark each item with the same nomenclature applied on the drawings or in the specifications.

b. The Contractor shall clearly indicate the size, finish, material, etc.

c. Where more than one model is shown on a manufacturer's sheet, the Contractor shall clearly indicate exactly which item and which data is intended.

d. All marks and identifications on the submittals shall be unambiguous.

7. Schedule submittals to expedite the project. Coordinate submission of related items.

8. Identify variations from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.

9. Reproduction of contract documents alone is not acceptable for submittals.

10. Incomplete submittals will be rejected without review. Partial submittals will only be reviewed with prior approval from the Architect/Engineer.

11. Submittals not required by the contract documents may be returned without review.

12. The Architect/Engineer's responsibility shall be to review one set of shop drawing submittals for each product. If the first submittal is incomplete or does not comply with the drawings and/or specifications, the Contractor shall be responsible to bear the cost for the Architect/Engineer to recheck and handle the additional shop drawing submittals.

13. Submittals shall be reviewed and approved by the Architect/Engineer before releasing any equipment for manufacture or shipment.

14. Contractor's responsibility for errors, omissions or deviation from the contract documents in submittals is not relieved by the Architect/Engineer's approval.

C. Electronic Submittal Procedures:

1. Distribution: Email submittals as attachments to all parties designated by the Architect/Engineer, unless a web-based submittal program is used.

2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.

3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.

   a. Submittal file name: 27 XX XX.description.YYYYMMDD

   b. Transmittal file name: 27 XX XX.description.YYYYMMDD

5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.

1.9 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 1.

B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.

2. Submit in Excel format.

3. Support values given with substantiating data.

C. Preparation:

1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.

2. Break down all costs into:

   a. Material: Delivered cost of product with taxes paid.

   b. Labor: Labor cost, excluding overhead and profit.

3. Itemize the cost for each of the following:

   a. Overhead and profit.

   b. Bonds.

   c. Insurance.

   d. General Requirements: Itemize all requirements.

4. For each line item having an installed cost of more than $5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:

   a. Structured cabling

   b. Overhead paging/intercom systems

   c. Security systems

      1) Surveillance

      2) Access control

      3) Intrusion

      4) Infant abduction

D. Update Schedule of Values when:

1. Indicated by Architect/Engineer.

2. Change of Subcontractor or supplier occurs.

3. Change of product or equipment occurs.

1.10 CHANGE ORDERS

A. A detailed material and labor take-off shall be prepared for each change order along with labor rates and mark-up percentages. Change orders with inadequate breakdown will be rejected.

B. Change order work shall not proceed until authorized.

1.11 EQUIPMENT SUPPLIERS' INSPECTION

A. The following equipment shall not be placed in operation until a representative of the manufacturer has inspected the installation and certified that the equipment is properly installed and that the equipment is ready for operation:

1. Firestopping, including mechanical firestop systems.

1.12 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

A. Exercise care in transporting and handling to prevent damage to fixtures, equipment and materials.

B. Store materials on the site to prevent damage.

C. Keep fixtures, equipment and materials clean, dry and free from deleterious conditions.

1.13 NETWORK / INTERNET CONNECTED EQUIPMENT

A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

1.14 WARRANTY

A. At a minimum, provide a one (1) year warranty for all equipment, materials, and workmanship. Individual specifications sections within Division 27 may require additional warranty requirements for specific equipment or systems.

B. The warranty period for the entire installation described in this Division of the specifications shall commence on the date of substantial completion unless a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner or their

representative.

C. Warranty requirements shall extend to correction, without cost to the final user, of all work and/or equipment found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage resulting from such defects or nonconformance with contract documents exclusive of repairs required as a result of improper maintenance or operation, or of normal wear as determined by the Architect/Engineer.

1.15 INSURANCE

A. This Contractor shall maintain insurance coverage as set forth in Division 1 of these specifications.

1.16 CONTINGENCY

A. Include in the Base Bid a contingency of one percent (1%) to be used only by change orders issued by the Architect/Engineer. The unused portion of the contingency shall be deducted from the Contract price before final payment is made.

1.17 MATERIAL SUBSTITUTION

A. Where several manufacturers' names are given, the first named manufacturer constitutes the basis for job design and establishes the equipment quality required.

B. Equivalent equipment manufactured by the other named manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meets all requirements of the drawings and specifications and fits in the allocated space. The Architect/Engineer shall make the final determination of whether a product is equivalent.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer via addendum. The Contractor bears full responsibility for the unnamed manufacturers equipment adequately meeting the intent of design. The Architect/Engineer may reject manufacturer at time of shop drawing submittal. The Contractor assumes all costs incurred by other trades on the project as a result of changes necessary to accommodate the offered material, equipment or installation method.

D. Should this Contractor be unable to secure approval from the Architect/Engineer for other unnamed manufacturers as outlined above, this Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder. Should a voluntary alternate material be accepted, This Contractor shall assume all costs that may be incurred as a result of using the offered material, article or equipment necessitating extra expense on This Contractor or on the part of other Contractors whose work is affected.

PART 2 - PRODUCTS

2.1 CABLE JACKET RATING

A. This project requires all cable jackets to carry a plenum rating.

2.2 REFER TO INDIVIDUAL SECTIONS.

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Installation of all conduit and cabling shall comply with **Sections 26 05 33 and 26 05 13.** Additional conduit requirements described within this Division shall be supplemental to the requirement described in Section 26 05 33. Should conflicts exist between the two Divisions the more stringent (more expensive material and labor) condition shall prevail until bidding addendum or construction clarification or RFI can be submitted and responded to. In no case shall the Contractor carry the least stringent condition in the pricing.

B. It is the Contractor's responsibility to survey the site and include all necessary costs to perform the installation as specified.

C. The Contractor shall be responsible for identifying and reporting to the Architect/Engineer any existing conditions including but not limited to damage to walls, flooring, ceiling and furnishings prior to start of work. All damage to interior spaces caused by this Contractor shall be repaired at this Contractor's expense to pre-existing conditions, including final colors and finishes.

D. All cables and devices installed in damp or wet locations, including any underground or underslab location, shall be listed as suitable for use in such environments. Follow manufacturer's recommended installation practices for installing cables and devices in damp or wet locations. Any cable or device that fails as a result of being installed in a damp or wet location shall be replaced at the Contractor's expense.

3.3 FIELD QUALITY CONTROL

A. General:

1. Refer to specific Division 27 sections for further requirements.

2. The Contractor shall conduct all tests required and applicable to the work both during and after construction of the work.

3. The necessary instruments and materials required to conduct or make the tests shall be supplied by the Contractor who shall also supply competent personnel for making the tests who has been schooled in the proper testing techniques.

4. In the event the results obtained in the tests are not satisfactory, This Contractor shall make such adjustments, replacements and changes as are necessary and shall then repeat the test or tests which disclose faulty or defective work or equipment, and shall make such additional tests as the Architect/Engineer or code enforcing agency deems necessary.

5. All communications cable tests that fail, including those due to excessive cabling lengths, shall be remedied by the Contractor without cost to the project.

B. Protection of cable from foreign materials:

1. It is the Contractor's responsibility to provide adequate physical protection to prevent foreign material application or contact with any cable type. Foreign material is defined as any material that would negatively impact the validity of the manufacturer's performance warranty. This includes, but is not limited, to overspray of paint (accidental or otherwise), drywall compound, or any other surface chemical, liquid or compound that could come in contact with the cable, cable jacket or cable termination components.

2. Application of foreign materials of any kind on any cable, cable jacket or cable termination component will not be accepted. It shall be the Contractor's responsibility to replace any component containing overspray, in its entirety, at no additional cost to the project. Cleaning of the cables with harsh chemicals is not allowed. This requirement is regardless of the PASS/FAIL test results of the cable containing overspray. Should the manufacturer and warrantor of the structured cabling system desire to physically inspect the installed condition and certify the validity of the structured cabling system (via a signed and dated statement by an authorized representative of the structured cabling manufacturer), the Owner may, at their sole discretion, agree to accept said warranty in lieu of having the affected cables replaced. In the case of plenum cabling, in addition to the statement from the manufacturer, the Contractor shall also present to the Owner a letter from the local Authority Having Jurisdiction stating that they consider the plenum rating of the cable to be intact and acceptable.

3.4 PROJECT CLOSEOUT

A. Refer to the Division 1 Section: PROJECT CLOSEOUT for requirements. The following paragraphs supplement the requirements of Division 1.

B. Final Jobsite Observation:

1. The Architect/Engineer will not perform a final jobsite observation until the project is ready. This is not dictated by schedule, but rather by completeness of the project.

2. Refer to the end of this specification section for a "STATEMENT INDICATING

READINESS FOR FINAL JOBSITE OBSERVATION."

3. The Contractor shall sign this form and return it to the Architect/Engineer so that the final observation can commence.

C. Before final payment will be authorized, this Contractor must have completed the following:

1. Submitted operation and maintenance manuals to the Architect/Engineer for review.

2. Submitted bound copies of approved shop drawings.

3. Record documents including edited drawings and specifications accurately reflecting field conditions, inclusive of all project revisions, change orders, and modifications.

4. Submitted a report stating the instructions given to the Owner's representative complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of This Contractor and shall be signed by the Owner's representative as having received the instructions.

5. Submitted testing reports for all systems requiring final testing as described herein.

6. Submitted start-up reports on all equipment requiring a factory installation inspection and/or start.

7. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site El Segundo ; submit receipt to Architect/Engineer prior to final payment being approved.

8. Provide System Assurance Warranty certificate for the telecommunications system.

3.5 OPERATION AND MAINTENANCE MANUALS

A. General:

1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer's review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer's comments. Once corrected, electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.

2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.

2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.

3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF

format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.

    a. O&M file name: O&M.div27.contractor.YYYYMMDD

    b. Transmittal file name: O&Mtransmittal.div27.contractor.YYYYMMDD

5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.

6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title "Operation and Maintenance Instructions", title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.

7. All text shall be searchable.

8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.

2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.

3. Copies of all final approved shop drawings and submittals. Include Architect's/Engineer's shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.

4. Copy of final approved test and balance reports.

5. Copies of all factory inspections and/or equipment startup reports.

6. Copies of warranties.

7. Schematic wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.

8. Dimensional drawings of equipment.

9. Capacities and utility consumption of equipment.

10. Detailed parts lists with lists of suppliers.

11. Operating procedures for each system.

12. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.

13. Repair procedures for major components.

14. List of lubricants in all equipment and recommended frequency of lubrication.

15. Instruction books, cards, and manuals furnished with the equipment.

3.6 INSTRUCTING THE OWNER'S REPRESENTATIVE

A. Adequately instruct the Owner's designated representative or representatives in the maintenance, care, and operation of the complete systems installed under this contract.

B. Provide verbal and written instructions to the Owner's representative or representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.

C. Contractor shall make a DVD video recording of instructions to the Owner while explaining the system so additional personnel may view the instructions at a later date. The video recording shall be the property of the Owner.

D. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.

E. Notify the Architect/Engineer of the time and place for the verbal instructions to be given to the Owner's representative so a representative can be present if desired.

F. Refer to the individual specification sections for minimum hours of instruction time for each system.

G. Operating Instructions:

1. The Contractor is responsible for all instructions to the Owner and/or Owner's operating staff on the Communications Systems.

2. If the Contractor does not have Engineers and/or Technicians on staff who can adequately provide the required instructions on system operation, performance, troubleshooting, care and maintenance, the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.7 SYSTEM COMMISSIONING

A. The Communications Systems included in the construction documents are to be complete and operating systems. The Architect/Engineer will make periodic job site observations during the construction period. The system start-up, testing, configuration, and satisfactory system performance is the responsibility of the Contractor. This shall include all calibration and adjustments of electrical equipment controls, equipment settings, software configuration, troubleshooting and verification of software, and final adjustments that may be required.

B. All operating conditions and control sequences shall be simulated and tested during the start-up period.

C. The Contractor, subcontractors, and equipment suppliers are expected to have skilled technicians to ensure that the system performs as designed. If the Architect/Engineer is requested to visit the job site for the purpose of trouble shooting, assisting in the satisfactory start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period through no fault of the design; the Contractor shall reimburse the Owner on a time and material basis for services rendered at the Architect/Engineer's standard hourly rates in effect at the time the services are requested. The Contractor shall be responsible for making payment to the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.8 RECORD DOCUMENTS

A. Refer to the Division 1 Section: PROJECT CLOSEOUT for requirements. The following paragraphs supplement the requirements of Division 1.

B. Mark specifications to indicate approved substitutions, change orders, and actual equipment and materials used.

C. This Contractor shall maintain at the job site, a separate and complete set of technology drawings which shall be clearly and permanently marked and noted in complete detail any changes made to the location and arrangement of equipment or made to the Technology Systems and wiring as a result of building construction conditions or as a result of instructions from the Architect or Engineer. All Change Orders, RFI responses, Clarifications and other supplemental instructions shall be marked on the documents. Record documents that merely reference the existence of the above items are not acceptable. Should This Contractor fail to complete Record Documents as required by this contract, This Contractor shall reimburse Architect/Engineer for all costs to develop record documents that comply with this requirement. Reimbursement shall be made at the Architect/Engineer's hourly rates in effect at the time of work.

D. Record actual routing of all conduits sized 2" or larger.

E. The above record of changes shall be made available for the Architect and Engineer's examination during any regular work time.

F. Upon completion of the job, and before final payment is made, This Contractor shall give the marked-up drawings to the Architect/Engineer.

3.9 ADJUST AND CLEAN

A. Contractor shall thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project.

B. Contractor shall clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from equipment.

C. Contractor shall remove all rubbish, debris, etc., accumulated during the Contractor's operations from the premises.

3.10 CONSTRUCTION WASTE MANAGEMENT

A. This Contractor shall comply with all construction and demolition waste disposal and recycling requirements.

1. This Contractor shall coordinate with the General Contractor to develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled.

2. The Contractor shall track waste disposal and recycling efforts throughout the construction process for all materials associated with this Contractor's scope of work. The Contractor shall provide this information to the General Contractor so that it can be incorporated with similar information from all other contractors for the project.

    a. Calculations for waste and recycled material can be done by weight or volume, but they must be consistent throughout the project. The Contractor shall coordinate with the General Contractor to establish the preferred calculation method and report the results accordingly.

    b. Excavated soil and land-clearing debris do not count towards the waste disposal or recycled material.

3. At a minimum, 50% of the construction and demolition debris for this project must be recycled or salvaged.

STATEMENT INDICATING READINESS FOR FINAL JOBSITE OBSERVATION

To assist the contractor in a timely close-out of the project, it is crucial that the final jobsite observation is not conducted prior to the project being ready. The contractor is required to review the completion status of the project at the time the observation is scheduled. This review, and the subsequent submittal of this form to the Architect/Engineer, shall indicate the contractor's agreement that the area of the project being requested for final observation is ready as defined below. The following list represents the degree of completeness required prior to requesting a final observation:

1. All cabling pathways (cable tray, ladder rack, conduit sleeves, etc.) are installed and all cabling has been pulled through them.
2. All mechanical firestop products are installed and all other penetrations have been sealed.
3. All telecommunications jacks are installed in the faceplates.
4. All telecommunications cabling is pulled and at least 75% of all jacks have been terminated at the jack and at the telecom room.
5. Telecommunications testing is in progress and at least 25% of testing has been completed.
6. Telecommunications labeling has been provided on at least 25% of each type of component requiring a label.
7. All telecommunications related grounding is complete.
8. All Audio/Visual components, cabling and control systems are installed, programmed and operational.
9. All overhead or integrated paging systems, including speakers, back boxes, cabling, and power supplies, and all headend equipment is installed, programmed and operational.
10. All CCTV cameras, mounts, cabling and all headend equipment are installed, programmed and operational.
11. All access control system equipment, including card readers, conduits, cabling, electronic locks, controllers and all headend equipment, is installed, programmed and operational.

Prime Contractor:_____ By: _____

Requested Observation Date_____ Today's Date: _____

Contractor shall sign this readiness statement and transmit to Architect/Engineer at least 10 days prior to the requested date of observation.

It is understood that if the Architect/Engineer finds that the project is not complete as defined above and that the final jobsite observation cannot be completed on the requested date, the Architect/Engineer will return to the site at a later date. All additional visits to the site for the purposes of completing the final observation will be billed T&M to the Contractor at our standard hourly rates, including travel expenses or the contractor's retainage may be deducted for the same amount.

There are specific Contractor qualification requirements for this project as defined in Section 27 05 00, which may include Manufacturer Certification and RCDD or CNIDP credentials. This Proof of Certification document, and the supporting documentation require herein, is required to be submitted at the time of bid to show compliance with the requirements of 27 05 00.

Statement of Compliance:

The named Contractor's base bid is a structured cabling solution from the connectivity manufacturer

<Insert>. Named Contractor is trained and certified, under the named manufacturer's formal certification program to provide and install all materials and work required by this project. Further, said Contractor is authorized, by the named manufacturer, to offer all product, labor and system assurance warranties required for this project by these contract documents.

The certification of this named manufacturer is valid, current and in effect as of the bid day of this project, the____day of__, 20____.

The named Contractor is not employing any other sub-contractor on the telecommunications portion of this project that does not also meet this certification requirement.

Contractor Company Name: ___

Authorized Representative: (print) _____

Date: ___

Manufacturer Certification Number (if any): ___

If this project requires RCDD certification, complete the following:

RCDD or CNIDP Name: _____ RCDD #:_____Expiration: ____

Submit the following with the bid: This form.

Proof of Manufacturer Certification indicated above. Proof of RCDD or CNIDP status.

END OF SECTION

SECTION 27 05 03

THROUGH PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Through-Penetration Firestopping.

1.2 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this Section.

B. Installer: Individuals performing work shall be certified by the manufacturer of the system selected for installation.

1.3 REFERENCES

A. UL 263 - Fire Tests of Building Construction and Materials

B. UL 723 - Surface Burning Characteristics of Building Materials

C. ANSI/UL 1479 - Fire Tests of Through Penetration Firestops

D. UL 2079 - Tests for Fire Resistance of Building Joint Systems

E. UL Fire Resistance Directory Through Penetration Firestop Systems (XHEZ)

F. Intertek / Warnock Hersey - Directory of Listed Products

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

H. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Firestops

I. CBC California Building Code

J. The Building Officials and Code Administrators National Building Code

K. 2024 International Building Code

1.4 SUBMITTALS

A. Submit under provisions of Section 27 05 00.

B. Submit Firestopping Installers Certification for all installers on the project.

C. Shop Drawings: Submit for each condition requiring firestopping. Include descriptions of the specific penetrating item, actual wall/floor construction, manufacturer's installation instructions, and UL or Intertek / Warnock Hersey Assembly number.

D. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:

1. Types of penetrating items.

2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.

3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

4. F ratings for each firestop system.

E. Maintain a notebook on the job site at all times that contains copies of approved submittals for all through penetration firestopping to be installed. Notebook shall be made available to the Authority Having Jurisdiction at their request and turned over to the Owner at the end of construction as part of the O&M Manuals.

F. Submit VOC rating of firestopping material in g/L (less water) with documentation that it meets the limits set forth in SCAQMD Rule 1168.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store, protect and handle products on site. Accept material on site in factory containers and packing. Inspect for damage. Protect from deterioration or damage due to moisture, temperature changes, contaminants, or other causes. Follow manufacturer's instructions for storage.

B. Install material prior to expiration of product shelf life.

1.6 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following fire-resistance-rated constructions, including both empty 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 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. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per UL 1479:

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

2. L-Rated Systems: Provide through-penetration firestop systems with L-ratings of not

more than 5.0 cfm/sq.ft. at both ambient temperature and 400°F.

C. For through-penetration firestop systems exposed to light, traffic, moisture, or physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

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.

E. For through-penetration firestop systems in air plenums, provide products with flame-spread and smoke-developed indexes of less than 25 and 50, respectively, as determined per ASTM E 84.

F. Adhesives and Sealants: All sealers, adhesives, and sealants shall comply with the low emitting material limits of the following standards:

1. LEED [v4] <Insert> Low Emitting Materials - Adhesives and Sealants.

2. CDPH Standard Method V1.1-2010 - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions VOC from Indoor Sources Using Environmental Chambers Version 1.1.

3. South Coast Air Quality Management District Rule 1168 - Adhesive and Sealant Applications. All adhesives and sealants wet-applied on site shall comply with the applicable chemical content requirements of SCAQMD Rule 1168.

4. South Coast Air Quality Management District Rule SCAQMD 1113 - Wet Applied Paints and Coatings. All paints and coatings wet-applied on site must meet the applicable VOC limits of SCAQMD Rule 1113.

1.7 MEETINGS

A. Pre-installation meeting: A pre-installation meeting shall be scheduled and shall include the[Construction Manager][General Contractor], all Subcontractors associated with the installation of systems penetrating fire barriers, Firestopping Manufacturer's Representative, and the Owner.

1. Review foreseeable methods related to firestopping work.

2. Tour representative areas where firestopping is to be installed; inspect and discuss each type of condition and each type of substrate that will be encountered, and preparation to be performed by other trades.

1.8 WARRANTY

A. Provide one year warranty on parts and labor.

B. Warranty shall cover repair or replacement of firestop systems which fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance,

stain resistance, general durability, or appear to deteriorate in any manner not clearly specified by the manufacturer as an inherent quality of the material.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers. All firestopping systems installed shall be provided by a single manufacturer.

1. 3M; Fire Protection Products Division

2. Hilti, Inc.

3. RectorSeal Corporation, Metacaulk

4. Tremco; Sealant/Weatherproofing Division

5. Johns-Manville

6. Specified Technologies Inc. (S.T.I.)

7. Spec Seal Firestop Products

8. AD Firebarrier Protection Systems

9. Wiremold/Legrand: FlameStopper

10. Dow Corning Corp

11. Fire Trak Corp

12. International Protective Coating Corp

2.2 THROUGH PENETRATION FIRESTOP SYSTEMS

A. Provide materials and systems classified by or listed by Intertek / Warnock Hersey to provide firestopping equal to time rating of construction being penetrated.

B. All firestopping materials shall be free of asbestos, lead, PCB's, and other materials that would require hazardous waste removal.

C. Firestopping shall be flexible to allow for normal penetrating item movement due to expansion and contraction.

D. Firestopping systems for plumbing and wet pipe sprinkler piping shall be moisture resistant.

E. Provide firestopping systems capable of supporting floor loads where systems are exposed to possible floor loading or traffic.

F. Provide firestopping systems allowing continuous insulation for all insulated pipes.

G. Provide firestopping systems classified by UL or listed by Intertek / Warnock Hersey for penetrations through all fire rated construction. Firestopping systems shall be selected from the UL or listed by Intertek / Warnock Hersey Fire Resistance Directory Category XHEZ based on substrate construction and penetrating item size and material and shall fall within the range of numbers listed:

1. Combustible Framed Floors and Chase Walls - 1 or 2 Hour Rated

   a. F Rating = Floor/Wall Rating

   b. L Rating = Penetrations in Smoke Barriers

Penetrating Item	UL System No.
No Penetrating Item	FC 0000-0999*
Metallic Pipe or Conduit	FC 1000-1999
Non-Metallic Pipe or Conduit	FC 2000-2999
Electrical Cables	FC 3000-3999
Insulated Pipes	FC 5000-5999
Bus Duct and Misc. Electrical	FC 6000-6999
Duct without Damper and Misc. Mechanical	FC 7000-7999
Multiple Penetrations	FC 8000-8999

2. Non-Combustible Framed Walls - 1 or 2 Hour Rated

   a. F Rating = Wall Rating

   b. L Rating = Penetrations in Smoke Barriers

Penetrating Item	UL System No.
No Penetrating Item	WL 0000-0999*
Metallic Pipe or Conduit	WL 1000-1999
Non-Metallic Pipe or Conduit	WL 2000-2999
Electrical Cables	WL 3000-3999
Insulated Pipes	WL 5000-5999
Bus Duct and Misc. Electrical	WL 6000-6999

Duct without Damper and Misc. Mechanical	WL 7000-7999
Multiple Penetrations	WL 8000-8999

3. Concrete or Masonry Floors and Walls - 1 or 2 Hour Rated

a. F Rating = Wall/Floor Rating

b. L Rating = Penetrations in Smoke Barriers

Penetrating Item	UL System No.
No Penetrating Item	CAJ 0000-0999*
Metallic Pipe or Conduit	CAJ 1000-1999
Non-Metallic Pipe or Conduit	CAJ 2000-2999
Electrical Cables	CAJ 3000-3999
Insulated Pipes	CAJ 5000-5999
Bus Duct and Misc. Electrical	CAJ 6000-6999
Duct Without Damper and Miscellaneous Mechanical	CAJ 7000-7999
Multiple Penetrations	CAJ 8000-8999

*Alternate method of firestopping is patching opening to match original rated construction.

H. Any opening in walls or floors not covered by the listed series of numbers shall be coordinated with the firestopping manufacturer.

I. Any openings in floors or walls not described in the UL or listed by Intertek / Warnock Hersey Fire Resistance Directory, or outlined in manufacturer's information shall be sealed in a manner agreed upon by the Firestopping Manufacturer, Owner, and the Authority Having Jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Ensure all surfaces that contact seal materials are free of dirt, dust, grease, oil, rust, or loose materials. Clean and repair surfaces as required. Remove laitance and form-release agents from concrete.

B. Ensure substrate and penetrating items have been permanently installed prior to installing firestopping systems. Ensure penetrating items have been properly spaced and have proper clearance prior to installing firestopping systems.

C. Surfaces to which sealing materials are to be installed must meet the selected UL or Intertek /

Warnock Hersey system substrate criteria.

D. Prime substrates where recommended in writing by through-penetration firestop system manufacturer. Confine primer to area of bond.

3.2 INSTALLATION

A. In existing construction, provide firestopping of openings prior to and after installation of penetrating items. Remove any existing coatings on surfaces prior to firestopping installation. Temporary firestopping shall consist of packing openings with fire resistant mineral wool for the full thickness of substrate, or an alternate method approved by the Authority Having Jurisdiction. All openings shall be temporarily firestopped immediately upon their installation and shall remain so until the permanent UL or listed by Intertek / Warnock Hersey listed firestopping system is installed.

B. Install penetration seal materials in accordance with printed instructions of the UL or Intertek / Warnock Hersey Fire Resistance Directory and with the manufacturer's printed application instructions.

C. Install dams as required to properly contain firestopping materials within openings and as required to achieve required fire resistance rating. Remove combustible damming after appropriate curing.

3.3 CLEANING AND PROTECTING

A. Clean 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 cause damage.

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, remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

3.4 IDENTIFICATION

A. Provide and install labels adjacent to each firestopping location. Label shall be provided by the firestop system supplier and contain the following information in a contrasting color:

1. The words "Warning - Through Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."

2. Firestop System Supplier; UL or listed by Intertek / Warnock Hersey system number; date installed; contractor name and phone number; manufacturer's representative name, address, and phone number.

3.5 INSPECTION

A. All penetrations shall be inspected by the manufacturer's representative to ensure proper

installation.

B. Access to firestop systems shall be maintained for examination by the Authority Having Jurisdiction at their request.

C. Proceed with enclosing through-penetration firestop system with other construction only after inspection reports are issued and firestop installations comply with requirements.

D. The contractor shall allow for visual destructive review of 5% of installed firestop systems (minimum of one) to prove compliance with specifications and manufacturer's instructions and details. Destructive system removal shall be performed by the contractor and witnessed by the Architect/Engineer and manufacturer's factory representative. The Architect/Engineer shall have sole discretion of which firestop system installations will be reviewed. The contractor is responsible for all costs associated with this requirement including labor and material for removing and replacing the installed firestop system. If any firestop system is found to not be installed per manufacturer's specific instructions and details, all firestop systems are subject to destructive review and replacement at the Architect/Engineer's discretion and the contractor's expense.

END OF SECTION

SECTION 27 05 26

COMMUNICATIONS BONDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Bonding Conductors

B. Bonding Connectors

1.2 RELATED WORK

A. Section 26 05 33 - Conduit and Boxes

B. Section 26 05 13 - Wire and Cable

C. Section 26 05 26 - Grounding and Bonding

D. Section 26 41 00 - Lightning Protection Systems

E. Section 27 05 00 - Basic Communications Systems Requirements

F. Section 27 05 03 - Through Penetration Firestopping

G. Section 27 11 00 - Communication Equipment Rooms

H. Section 27 05 28 - Interior Communication Pathways

I. Section 27 05 53 - Identification and Administration

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for relevant standards.

B. Communications bonding system component, device, equipment, and material manufacturer(s) shall have a minimum of five (5) years documented experience in the manufacture of communications bonding products.

C. The entire installation shall comply with all applicable electrical codes, safety codes, and standards. All applicable components, devices, equipment, and material shall be listed by Underwriters' Laboratories, Inc.

1.4 REFERENCES

A. ANSI/IEEE 1100 - Recommended Practice for Power and Grounding Sensitive Electronic Equipment in Industrial and Commercial Power Systems

B. ANSI/TIA/EIA 568-C - Commercial Building Telecommunications Cabling Standard

C. ANSI/TIA/EIA 569-A - Commercial Building Standard for Telecommunications Pathways and Spaces

D. ANSI/TIA/EIA 606 - Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

E. ANSI/TIA/EIA 758 - Customer Owned Outside Plant

F. ANSI-J-STD-607-A - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

G. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements

H. IEEE 837 - IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding

I. NFPA 70 - National Electrical Code

J. NFPA 780 - Standard for the Installation of Lightning Protection Systems

K. UL 96 - Lightning Protection Components

L. UL 96A - Installation Requirements for Lightning Protection Systems

M. UL 467 - Grounding and Bonding Equipment

1.5 SUBMITTALS

A. Submit product data and shop drawings under provisions of Section 27 05 00 and Division 1.

B. Provide manufacturer's technical product specification sheet for each individual component type. Submitted data shall show the following:

1. Compliance with each requirement of these documents. The submittal shall acknowledge each requirement of this section, item-by-item, including construction, materials, ratings, and all other parameters identified in Part 2 - Products.

2. Manufacturer's installation instructions indicating application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

C. Provide CAD-generated, project-specific system shop drawings as follows:

1. Provide a system block diagram indicating system configuration, system components, interconnection between components, and conductor routing. The diagram shall clearly indicate all wiring and connections required in the system. When multiple devices or pieces of equipment are required in the exact same configuration (e.g., multiple identical equipment racks or sections of ladder tray), the diagram may show one device and refer to the others as "typical" of the device shown. The diagram shall list room numbers where system equipment will be located.

2. Installation details for all system components.

D. Provide system checkout test procedure to be performed at acceptance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the site under the provisions of Section 27 05 00.

B. Store and protect products under the provisions of Section 27 05 00.

C. Contractor shall exercise care to prevent corrosion of any products prior to installation. Corroded products shall not be acceptable for use on this project.

1.7 SYSTEM DESCRIPTION

A. This section describes the requirements for the furnishing, installation, adjusting, and testing of a complete turnkey communications bonding system, including connection to the electrical ground grid to the existing system.

B. Performance Statement: This specification section and the accompanying drawings are performance based, describing the minimum material quality, required features, operational requirements, and performance of the system. These documents do not convey every wire that must be installed, every equipment connection that must be made, or every feature and function that must be configured. Based on the equipment constraints described and the performance required of the system as presented in these documents, the Contractor is solely responsible for determining all components, devices, equipment, wiring, connections, and terminations required for a complete and operational system that provides the required performance.

C. This document describes the major components of the system. All additional hardware, subassemblies, supporting equipment, and other miscellaneous equipment required for complete, proper system installation and operation shall be provided by the Contractor.

D. Basic System Requirements:

1. Refer to the drawings and the requirements of ANSI-J-STD-607-A and NFPA 70 for complete information.

2. The bonding system shall include, but not be limited to, the following major components:

a. Bonding Conductor for Telecommunications (BCT)

b. Bonding Conductor(s) (BC)

c. Bonding Connectors

d. Bonding system labeling and administration as defined in Section 27 05 53.

1.8 PROJECT RECORD DOCUMENTS

A. Submit documents under the provisions of Section 27 05 00.

B. Provide final system block diagram showing any deviations from approved shop drawing

submittal.

C. Provide floor plans that document the following:

1. Actual locations of system components, devices, and equipment.

2. Actual conductor routing.

3. Actual system component, device, equipment, and conductor labels.

D. Provide statement that system checkout test, as outlined in the approved shop drawing submittal, is complete and test results were satisfactory.

E. Complete all operation and maintenance manuals as described below.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 27 05 00.

B. Submitted data shall include:

1. Approved shop drawings.

2. Descriptions of recommended system maintenance procedures, including:

a. Inspection

b. Periodic preventive maintenance

c. Fault diagnosis

d. Repair or replacement of defective components

PART 2 - PRODUCTS

2.1 BONDING CONDUCTORS

A. Bare Copper:

1. Annealed uncoated stranded conductor.

2. Minimum size 6 AWG.

B. Insulated Copper:

1. Annealed uncoated stranded conductor.

2. Insulation:

a. PVC insulation with nylon outer jacket.

b. Rated at 600 volts.

c. Green.

3. Minimum size 6 AWG.

C. All bonding conductors shall be listed and recognized by a nationally recognized testing laboratory as being suitable for the intended purpose and for installation in the space in which they are installed.

D. Bonding Conductor Sizing

1. All communications bonding system conductors shall be sized by length as follows:

Length Linear ft (m)	Size (AWG)
Less than 13 (4)	6
14 - 20 (4 - 6)	4
21 - 26 (6 - 8)	3
27 - 33 (8 - 10)	2
34 - 41 (10 - 13)	1
42 - 52 (13 - 16)	1/0
53 - 66 (16 - 20)	2/0
Greater than 66 (20)	3/0

2. The BCT shall be the same size as the TBB or larger.

2.2 BONDING CONNECTORS

A. Acceptable Types:

1. Two-hole compression lug

2. Exothermic weld

3. Irreversible compression

B. Connectors shall be provided in kit form and selected per manufacturer's written instructions.

C. Connectors shall comply with IEEE 837 and UL 467 and be listed for use for specific types, sizes, and combinations of conductors and connected items.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Bonding Conductor Requirements:

1. Bonding conductors shall be green or marked with a distinctive green color.

2. Bonding conductors shall be routed parallel and perpendicular to building structure along shortest and straightest paths possible. Number of bends and changes in direction should be minimized. Install and secure conductors in a manner that protects the conductors from impact and from physical or mechanical strain or damage.

3. Bonding conductors shall not be installed in metallic conduit.

4. All conductors, including, but not limited, to the BCT, TBB, GE(s), and BC(s), shall be installed splice-free. If the Contractor believes that site conditions do not allow a splice-free installation, the Contractor may request permission from the Architect/Engineer to splice a specific communications bonding system conductor.

    a. Where documented permission to splice a conductor is granted:

        1) The number of splices shall be limited to as few as possible.

        2) Splices shall be made using exothermic welding or irreversible compression-type connections only. Splice hardware shall be listed for grounding and bonding. Solder is not an acceptable means of splicing conductors.

        3) Splices shall be made in telecommunications spaces in accessible locations to facilitate future inspection and maintenance.

        4) Splices shall be adequately supported and protected from impact and from physical or mechanical strain or damage.

5. All bonding conductors shall be labeled in accordance with the requirements of Section 27 05 53. In addition to the requirements of Section 27 05 53:

    a. Labels shall be nonmetallic.

    b. Labels shall be printer-generated.

    c. Labels shall be located on conductors as close as is practical to their point of termination in a readable position.

    d. Additionally, conductors shall be labeled as follows:

        1) "IF THIS CONNECTOR OR CABLE IS LOOSE OR MUST BE REMOVED, PLEASE CALL THE BUILDING TELECOMMUNICATIONS MANAGER."

6. Interior water piping is not acceptable for use as a communications bonding system bonding conductor.

7. Metallic cable shields are not acceptable for use as communications bonding system bonding conductors.

B. Bonding Connection Requirements:

1. Make all connections in accessible locations to facilitate future inspection and maintenance.

2. Communications bonding system connections shall be made using exothermic welding, two-hole compression lugs, or other irreversible compression-type connections. The use of 1-hole lugs is prohibited, except for connections to a rack-mount telecommunications ground bar. Connection hardware shall be listed for grounding and bonding. Sheet metal screws shall not be used to make communications bonding system connections.

3. Thoroughly clean conductors before installing lugs and connectors.

4. Install and tighten all connectors in accordance with manufacturer's instructions, using the appropriate purpose-designed tool(s) recommended by the manufacturer for that purpose. Exercise care not to tighten connectors beyond manufacturer's recommendations.

5. Where necessary, remove paint and/or use paint-piercing washers to provide proper electrical bond at all connections.

6. All bonding connections shall be coated in anti-oxidant joint compound that is purpose-designed and purpose-manufactured for that use. Anti-oxidant joint compound shall be applied in accordance with manufacturer's recommendations and instructions.

7. All installed connectors on conductors installed in damp locations shall be sealed with dielectric grease and then covered with heat shrink tubing to protect against moisture ingress. Applied heat shrink tubing shall overlap conductor's outer jacket a minimum of four (4) inches past connector and be installed in accordance with manufacturer's recommendations and instructions.

3.2 FIELD QUALITY CONTROL

A. Field testing shall be performed under provisions of Section 27 05 00.

B. Where these specifications require a product or assembly without the use of a brand or trade name, provide a product from a reputable manufacturer that meets the requirements of the specifications.

C. Periodic observations will be performed during construction to verify compliance with the requirements of the specifications. These services do not relieve the Contractor of responsibility for compliance with the contract documents.

3.3 ADJUSTING

A. Adjust work under provisions of Section 27 05 00.

B. Contractor shall make any and all adjustments to the communications bonding system necessary to ensure that the installed system meets all requirements listed herein. Modifications necessary to comply with listed requirements or to provide specified performance shall be completed by the Contractor at no additional cost to the Owner.

3.4 TESTING

A. Test installed system under provisions of Section 27 17 10.

END OF SECTION

SECTION 27 05 28

INTERIOR COMMUNICATION PATHWAYS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, tests and services to install complete conduits, sleeves, etc., for an interior cabling plant as shown on the drawings.

1.2 RELATED WORK

A. Section 26 05 33 - Conduit and Boxes

B. Section 27 05 00 - Basic Communications Systems Requirements

C. Section 27 05 26 - Communications Bonding

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for requirements.

1.4 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code

1.5 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to the start of work the Contractor shall submit:

1. Manufacturer's data covering all products proposed, including construction, materials, ratings and all other parameters identified in Part 2 - Products, below.

2. Manufacturer's installation instructions.

B. Coordination Drawings:

1. Include conduit sleeve layout in composite electronic coordination files. Refer to Section 27 05 00 for coordination drawing requirements.

1.6 DRAWINGS

A. The drawings, which constitute a part of these specifications, indicate the general route of the wire mesh support systems, conduit, sleeves, etc. Data presented on these drawings is as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification of all dimensions, routing, etc., is required.

PART 2 - PRODUCTS

2.1 CONDUIT

A. Refer to Section 26 05 33 for conduit requirements for this project.

2.2 CABLE HANGERS AND SUPPORTS

A. Provide a non-continuous cable support system suitable for use with open cable.

B. Cable Hooks:

1. Construction: Flat bottom design with a minimum cable bearing surface of 1-5/8". Hooks shall have 90-degree radius edges.

2. All cable hook mounting hardware shall be recessed to prevent damage to cable during installation. Installed cabling shall be secured using a cable latch retainer that shall be removable and reusable.

3. Finish: Pre-galvanized steel, ASTM A653 suitable for general duty use zinc plated steel, ASTM B633 SC3 suitable for heavy duty use. Provide stainless steel AISI Type 304 hooks for corrosive locations.

C. Cable Hangers:

1. Adjustable, non-continuous cable support slings for use with low voltage cabling.

2. Steel and woven laminate construction, rated for indoor non-corrosive use. Laminate material shall be suitable for use in plenum environments.

3. Sling length shall be adjustable to a capacity of 425 4-pair UTP cables.

4. Cabling hanger load limit shall be 100 lbs. per foot.

5. Manufacturer:

a. Erico Caddy

b. CableCat CAT425

c. Arlington Fittings Tl Series

d. Or approved equal.

PART 3 - EXECUTION

3.1 CABLE HOOK SUPPORT SYSTEM

A. In areas where cabling is not supported by cable tray, ladder rack, enclosed wireway or installed in conduit, such cabling shall be supported by an approved cable hook support system.

B. Refer to manufacturer's requirements for allowable fill capacity for selected cable hook. In no case shall a 40% fill capacity be exceeded.

C. Cable hooks shall be securely mounted per manufacturer's instructions. In no case shall the side-to-side travel of any cable hook exceed 6".

D. Cable hooks shall be selected based on the contractor's cable routing. Hooks shall be capable of supporting a minimum of 30 pounds with a safety factor of 3.

E. J-hook support spans shall be based on the smaller of the manufacturer's load ratings and code requirements. In no case shall horizontal spans exceed 5 feet and vertical spans exceed 4 feet.

F. The resting and supporting of cabling on structural members shall not meet the requirements for cabling support specified herein.

G. The use of tie-wraps or hook and loop type fasteners is specifically prohibited as a substitute for cable hooks specified herein.

3.2 CONDUIT AND CABLE ROUTING

A. Refer to Section 26 05 33 for additional requirements.

B. All conduits shall be reamed and shall be installed with a nylon bushing.

C. Maintain appropriate conduit bend radius at all times. For conduits with an internal diameter of less than 2", maintain a bend radius of at least 6 times the internal diameter. For conduits with an internal diameter 2" or greater, maintain a bend radius of at least 10 times the internal diameter.

D. No conduit or sleeve containing more than two (2) cables shall exceed[40%] <Insert> fill ratio, regardless of length.

E. Any conduit exceeding 90' in length or containing more than two (2) 90-degree bends shall contain a pull box sized per ANSI/TIA/EIA 569 requirements.

1. A separate pull box is required for each 90' (or greater) length section.

2. A separate pull box is required after any two (2) consecutive 90-degree bends.

3. Pull box shall be located in an area that maintains accessibility of box, including the ability to remove box lid without removal or relocation of any other materials.

F. Any conduit with bends totaling 90 degrees or more shall have the fill capacity derated by 15% for each 90 degrees of cumulative bend.

G. Cables installed in any conduits that do not meet the above requirements shall be replaced at the Contractor's expense, after the conduit condition has been remedied.

3.3 ATTACHMENT TO METAL DECKING

A. Where supports for cable hook systems attach to metal roof decking, excluding concrete on metal decking, do not exceed 25 lbs. per hangar and a minimum spacing of 2'-0" on center. This 25-lb. load and 2'-0" spacing include adjacent electrical and mechanical items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

END OF SECTION

SECTION 27 05 53

IDENTIFICATION AND ADMINISTRATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the identification and administration requirements relating to the structured cabling system and its termination components and related subsystems.

B. Identification and labeling.

1.2 RELATED WORK

A. Section 27 05 00 - Basic Communications Systems Requirements

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for relevant standards.

B. Perform all work in accordance with State of California Standard.

1.4 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to the start of work the Contractor shall submit:

1. Documentation of labeling scheme.

2. Complete documentation of nomenclature for all Administration components.

PART 2 - PRODUCTS

2.1 LABELING

A. Adhesive labels shall meet the requirements of UL 969 (Ref D-16) for legibility, defacement and adhesion. Exposure requirements of UL 969 for indoor and outdoor (as applicable) use shall be met.

B. Insert labels shall meet the requirements of UL 969 for legibility, defacement and general exposure.

C. Labeling shall be consistent for all common elements in the project. This consistency shall include label size, color, typeface and attachment method.

D. Labels incorporating bar codes shall be either Code 39 conforming to USS-39 or Code 128 conforming to USS-128.

1. All Code 39 bar codes shall have a ratio between 2.5:1 and 3.0:1. Provide a minimum

"quite zone" of 0.25" on each side of the bar code.

2. A descriptive label for reading by personnel shall be provided with any bar code. Bar codes by themselves are not acceptable.

E. Color Code: Observe the following requirements for color coding:

1. Labels on each end of a cable shall be the same color for each termination.

2. Labels for cross-connects shall be two different colors at each termination fields, representative of the color of that field.

3. Orange (Pantone 15C) shall be used for the demarcation point.

4. Green (Pantone 353C) shall be used for the termination point of network connection on the facility side of the demarc.

5. Purple (Pantone 264C) shall be used to identify the termination of cables from common equipment (PBX, computers, LANS, etc.)

6. White shall be used to identify the first-level backbone termination in the main cross-connect.

7. Gray (Pantone 422C) shall be used to identify the second-level backbone termination in the main cross-connect.

8. Blue (Pantone 291C) shall be used to identify the termination of station cabling at the telecommunications closet and/or equipment room end of the cable.

9. Brown (Pantone 465C) shall be used to identify the termination of the interbuilding backbone cable terminations.

10. Yellow (Pantone 101C) shall be used to identify the termination of auxiliary circuits, alarms, maintenance, security, etc.

11. Red (Pantone 184C) shall be used to identify the termination of key telephone systems.

12. In facilities that do not contain a main cross-connect, the color white may be used to identify second-level backbone terminations.

F. Tag all CAT 6A cables at both the Communications Equipment Room and the information outlets using the following alphanumeric labeling system:

1. (Room Number) - (Outlet Number) - (Jack Number) - (Use).

2. "Outlet Number" shall start with 1 in each room, with additional outlets in each room numbered sequentially.

3. "Jack Number" shall start with 1 for the upper left jack in each outlet, increasing sequentially from left to right and top to bottom across the outlet face.

4. "Use" shall be designated by the following:

   a. "V" for voice (RJ-45)

   b. "D" for data (RJ-45)

   c. "C" for video (coax)

   d. "M" for multimedia retrieval (coax)

   e. "S" for speaker (RCA)

5. Example #1: "106-1-1-V" indicates the top left voice jack in outlet #1 in Room 106.

6. Example #2: "109-3-4-D" indicates the bottom right data jack (assuming a 4-port faceplate) in outlet #3 in Room 109.

G. Tag all CAT 6A cables at both the Communications Equipment Room and the information outlets using the following alphanumeric labeling system:

1. (Telecom Room Number) - (Patch Panel Letter) - (Patch Panel Port Number).

2. "Telecom Room Number" shall be as indicated on the drawings.

3. "Patch Panel Letter" shall start with 'A' for the top modular patch panel, increasing sequentially from top to bottom across the equipment rack.

4. "Patch Panel Port Number" shall start with '1' for the upper left port in each modular patch panel, increasing sequentially from left to right and top to bottom across the modular patch panel face.

5. Example #1: MC/1-A3 indicates the third modular patch panel port in modular patch panel 'A' in Main Equipment Room (MC/1).

6. Example #2: HC/2-C39 indicates the thirty-ninth modular patch panel port in modular patch panel C in Horizontal Cross-Connect room (HC/2).

2.2 DOCUMENTATION/AS-BUILTS/RECORDS

A. General:

1. Upon completion of the installation, the Contractor shall submit as-builts per the requirements of Section 27 05 00 and Division 1. Documentation shall include the items detailed in the subsections below.

2. All documentation, including hard copy and electronic forms shall become the property of the Owner.

B. Record Drawings:

1. The drawings are to include cable routes and outlet locations. Outlet locations shall be

identified by their sequential number as defined elsewhere in this document. Numbering, icons and drawing conventions used shall be consistent throughout all documentation provided.

PART 3 - EXECUTION

3.1 IDENTIFICATION AND LABELING

A. Cable Labeling: Horizontal cables shall be labeled at each end.

1. Provide additional cable labeling at each manhole and pull box.

2. Cables that are routed through multiple pathway segments shall contain reference to all pathway segments in the pathway linkage field.

3. Cables that differ only by performance class shall have a suitable marking or label to indicate the higher performance class. For example, station cabling utilizing the blue color, may include blue with a white stripe to indicate the higher performance class station cabling.

B. Information Outlet Labeling: Tag all voice and data jacks as defined herein.

C. Termination Hardware Labeling:

1. An identifier shall be provided at each termination hardware location or its label.

END OF SECTION

SECTION 27 11 00

COMMUNICATION EQUIPMENT ROOMS (CER)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the products and execution requirements related to furnishing and installing equipment for communication equipment rooms.

1.2 RELATED WORK

A. Section 27 05 00 - Basic Communications Systems Requirements

B. Section 27 05 26 - Communications Bonding

C. Section 27 05 28 - Interior Communication Pathways

D. Section 27 15 00 - Horizontal Cabling Requirements

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for applicable standards.

1.4 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to the start of work the Contractor shall submit:

1. Manufacturer's data covering all products including construction, materials, ratings and all other parameters identified in Part 2 - Products, below.

2. Manufacturer's installation instructions.

B. Coordination Drawings:

1. Refer to Section 27 05 00 for coordination drawing requirements.

PART 2 - PRODUCTS

2.1 EQUIPMENT GROUNDING

A. Refer to specification section 27 05 26 for grounding requirements.

B. All equipment required to be grounded shall be provided with a grounding lug suitable for termination of the specified size electrode conductor.

2.2 CABLE MANAGEMENT - HORIZONTAL

A. Equipment Racks:

1. Equipment racks shall be equipped with horizontal cable management hardware in the form of rings and guides. Racks shall incorporate horizontal covers, to allow an orderly, hidden, routing of copper jumpers from the modular patch panels to the customer provided network electronics. Horizontal cable management hardware shall be as follows:

a. Horizontal cable management hardware shall be 16 gauge cold rolled steel construction with six (6) pass-thru holes and seven (7) front-mounted 3.5" steel rod D-rings. Provide with cover designed to conceal and protect cable.

b. At a minimum, horizontal cable management hardware shall be positioned above and below (a) each grouping of two rows of jacks on modular patch panels.

2.3 PATCH PANELS

A. Where identified on the drawings in Communication Equipment Rooms, modular patch panels shall be furnished and installed by the Contractor for termination of copper cable.

B. Copper cabling shall be terminated in Communication Equipment Rooms on modular patch panels consisting of a modular connector system incorporating modular jacks meeting the specifications for the jacks detailed in Section 27 15 00.

C. The largest single modular patch panel configuration shall not exceed 48-Ports. Modular patch panels shall be fully populated (all ports occupied by jacks) and be provided in increments of no less than 12 jacks. High-density modular patch panels will not be accepted.

D. The modular patch panel blocks shall have the ability to seat and cut eight (8) conductors (4 pairs) at a time and shall have the ability of terminating 22- through 26-gauge plastic insulated, solid and stranded copper conductors. Modular patch panel blocks shall be designed to maintain the cables' pair twists as closely as possible to the point of mechanical termination.

E. Modular patch panels shall incorporate cable support and/or strain relief mechanisms to secure the horizontal cables at the termination block and to ensure that all manufacturers minimum bend radius specifications are adhered to.

2.4 COPPER PATCH CORDS

A. Modular Patch Panel:

1. Provide Category 6A copper patch cords for all assigned ports on the modular patch panel. Of these cords, 60% shall be 3' in length and 40% shall be 5' in length. These patch cords shall be the cross-connect between the network electronics and the horizontal RJ-45 modular patch panel. Copper patch cords shall be equipped with a 4-pair RJ-45 connector on each end.

2. Refer to Section 27 15 00 for cable and connector performance requirements.

3. Patch cords shall not be made-up in the field.

4. Basis of Design (Refer to 27 17 20 for Acceptable Manufacturers):

a. Hubbell HC Series

PART 3 - EXECUTION

3.1 D-RINGS

A. Provide D-rings for cable routing and management in all areas where open cabling is routed along the wall in an Equipment Room.

B. Locate D-rings on 24" centers vertically and horizontally.

C. Securely attach D-rings to the wall as required by the manufacturer.

3.2 CROSS CONNECT INSTALLATION

A. Bend radius of cable shall not exceed 4 times the outside cable diameter or manufacturer's recommendation, whichever is less.

B. Cables shall be neatly bundled and dressed to their respective panels and/or blocks. Each shall be fed by an individual bundle separated and dressed to the point of cable entrance into the rack and/or frame.

C. The cable jacket shall be maintained as close as possible to the termination point.

D. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that is visible without removing the bundle support.

3.3 CONDUITS AND CABLE ROUTING

A. Refer to Section 26 05 33 for additional requirements.

B. Where conduits enter a telecommunications room, conduits shall be terminated on the wall where shown on the contract documents.

C. All conduits shall be reamed and shall be installed with a nylon bushing.

D. Maintain appropriate conduit bend radius at all times. For conduits with an internal diameter of 2" or less, maintain a bend radius of at least 6 times the internal diameter. For conduits with an internal diameter greater than 2", maintain a bend radius of at least 10 times the internal diameter.

END OF SECTION

SECTION 27 15 00

HORIZONTAL CABLING REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the products and execution requirements relating to furnishing and installing horizontal communications cabling and termination components and related subsystems as part of a cabling plant. The cabling plant consists of copper cabling.

1.2 RELATED WORK

A. Section 27 05 00 - Basic Communications Systems Requirements

B. Section 27 17 20 - Structured Cabling System Warranty

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for relevant standards and plenum or non-plenum cable requirements.

B. The channel shall be required to meet the performance requirements indicated herein. The manufacturer shall warranty the performance of their system to the required performance (and not just to the Standard, should the required performance exceed the Standard).

C. Specific components of the channel shall be required, at a minimum, to meet the Standard component requirements for that particular component.

D. The installing contractor must be certified by the manufacturer of the structured cabling system.

1.4 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to the start of work the Contractor shall submit:

1. Manufacturer's data covering all products proposed, including construction, materials, ratings and all other parameters identified in Part 2 - Products, below.

2. Manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 HORIZONTAL CABLE

A.
A.
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A.

A. CAT 6A Cable:

1. The horizontal cable requirements must be met, as well as the following channel requirements.

2. CAT 6A cable shall terminate on rack-mounted modular patch panels in their respective communication equipment room as indicated on the drawings.

3. Cable shall exceed transmission requirements listed in ANSI/TIA/EIA-568-C.2. Performance tests shall be conducted using swept frequency testing through 500 MHz for the channel. All numbers given are for a 4-connection channel. Discrete frequency testing results at 500 MHz is not acceptable.

4. Performance tests shall be conducted using swept frequency testing through 500 MHz for the channel. All numbers given are for a 4-connection channel. Discrete frequency testing results at 500 MHz is not acceptable.

5. Performance data shall be provided by third-party independent testing laboratories only. Testing data shall be submitted on the third-party testing laboratory letterhead. Test data will only be accepted if it displays testing as a channel. Electrical characteristics of the performance of the cable itself will not satisfy this requirement.

6. The structured cabling and connectivity may be provided by the same company. For the purpose of this specification that shall mean that the cabling and connectivity must be marketed, branded, supported, warranted, and distributed by the same company. Specifically, ally or partnerships between cabling manufacturers and connectivity manufacturers do not meet this requirement unless otherwise listed in Section 27 17 20 as an acceptable manufacturer. Specifically, products made by others through an OEM relationship are acceptable if the products are marketed, branded, supported, warranted, and distributed by the same company.

7. The 4-connector channel performance margins in the table below shall be guaranteed margins above ANSI/TIA/EIA-568-C.2:

Electrical Value (1 - 500 MHz)	Minimum Margin
Insertion Loss:	3%
NEXT:	2 dB
PS NEXT:	3 dB
PSA NEXT:	3 dB
PSA NEXT (Average):	
ACR-F:	2 dB
PS ACR-F:	3 dB

PSA ACR-F:	3 dB
PSA ACR-F (Average):	3 dB
Return Loss:	2 dB

8. The jacket color for CAT 6A cable shall be **white** for voice applications and **blue** for data applications.

9. Basis of Design:

   a. Hubbell C6ASP Series

   b. Additional acceptable manufacturers:

      1) Belden

      2) Berk-Tek

      3) General Cable

      4) Panduit

      5) Siemon

      6) Superior Essex

2.2 CONNECTORS/COUPLERS/ADAPTERS

A. Refer to Section 27 11 00 for requirements and 27 13 00 for requirements.

B. Coax (F-Connector):

1. RG-6 and RG-11 coax cable shall be terminated at the work area and at communication equipment rooms in a male F-type connector.

2. The male F-type connector shall:

   a. Be matched to the RG-6 and RG-11 coax cable type proposed by the Contractor.

   b. Be a single-piece F-type connector.

   c. Incorporate a 1/2" crimp ring which uses hex crimp.

3. The male F-type connectors shall be mated to female/female feed-thru couplings at both the information outlet and modular patch panel locations. These couplings shall be matched to the male F-type connector. Couplings shall be of sufficient length as to allow for the male F-type connector to fully seat (both sides).

2.3 COPPER WORK AREA CORDS

A. RJ-45:

1. Provide the same quantity of **Category 6A** copper work area cords as copper patch panel cords specified in Section 27 11 00. Copper work area cords shall be equipped with an 8-pin modular RJ-45 connector on each end.

2. Work area cords shall be **10'** in length.

3. Manufacturer of copper patch cable shall be the same as the manufacturer of the horizontal copper cable.

PART 3 - EXECUTION

3.1 CABLE INSTALLATION REQUIREMENTS

A. Horizontal Cabling:

1. The maximum horizontal cable drop length for Data UTP shall not exceed 295 feet (90 meters) in order to meet data communications performance specifications. This length is measured from the termination panel in the wiring closet to the outlet and must include any slack required for the installation and termination. The Contractor is responsible for installing horizontal cabling in a fashion so as to avoid unnecessarily long runs. Any area that cannot be reached within the above constraints should be identified and reported to the Architect/Engineer prior to installation. Changes to the contract documents shall be approved by the Architect/Engineer.

2. All cable shall be free of tension at both ends. In cases where the cable must bear some stress, Kellum grips may be used to spread the strain over a longer length of cable.

3. Manufacturer's minimum bend radius specifications shall be observed in all instances.

4. Horizontal cabling installed as open cabling shall be supported at a maximum of 5-feet between supports. Refer to the specifications for required cable supports.

5. Horizontal cabling installed as open cable or in cable tray shall be bundled at not less than 10' intervals with hook-and-loop tie wraps. The use of plastic cable ties is strictly prohibited.

6. The maximum conduit fill for horizontal cabling shall not exceed 40% regardless of conduit length.

7. Cable sheaths shall be protected from damage from sharp edges. Where a cable passes over a sharp edge, a bushing or grommet shall be used to protect the cable.

B. A coil of 3 feet in each cable shall be placed in the ceiling at the last support (e.g., J-hook, bridle ring, etc.) before the cables enter a fishable wall, conduit, surface raceway or box. At any location where cables are installed into movable partition walls or modular furniture via a service pole, approximately 15-feet of slack shall be left in each horizontal cable under 250 feet in length to allow for change in the office layout without re-cabling. These "service loops" shall be secured at the last cable support before the cable leaves the ceiling and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.

1. Category 6A cables shall not be mixed with any other category cable in any bundle. Bundles of Category 6A cable shall maintain a 0.5" separation from bundles of cables containing different categories (e.g., Cat 6, Cat 5E).

2. To reduce or eliminate EMI, the following minimum separation distances from 480V power lines shall be adhered to:

    a. Twelve (12) inches from power lines of less than 5-kVa.

    b. Eighteen (18) inches from high-voltage lighting (including fluorescent).

    c. Thirty-nine (39) inches from power lines of 5-kVa or greater.

    d. Thirty-nine (39) inches from transformers and motors.

3. Information outlets shown on floor plans with the subscript "W" are intended to be used for wall mounted telephones. Back boxes for wall mounted telephones shall not be located within 12" vertically, or horizontally, from any light switches, power receptacles, nurse call devices, thermostats, or any other architectural element that would otherwise prevent the installation of a wall mounted telephone on the mating lugs.

C. Cable Terminations - Data UTP:

1. Modular patch panels shall be designed and installed in a fashion as to allow future horizontal cabling to be terminated on the panel without disruption to existing connections.

2. If the "last" patch (per rack) is greater than 50% utilized, one additional patch panel shall be provided for future use.

3. At information outlets and modular patch panels, the Contractor shall ensure that the twists in each cable pair are preserved to within 0.5-inch of the termination for data cables. The cable jacket shall be removed only to the extent required to make the termination.

END OF SECTION

SECTION 27 17 10

TESTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes the testing requirements relating to the structured cabling system and its termination components and related subsystems.

1.2 RELATED WORK

A. Section 27 05 00 - Basic Communications Systems Requirements

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for relevant standards.

1.4 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to the start of work, the Contractor shall submit:

1. Complete information on testing procedure as described herein.

2. Test plan summary for each cable type to be tested including equipment to be used, setup, test frequencies or wavelengths, results format, etc.

PART 2 - PRODUCTS

2.1 TESTING COPPER

A. General Requirements:

1. Perform acceptance tests as indicated below for each sub-system (e.g., backbone, horizontal, etc.) as it is completed.

2. Supply all equipment and personnel necessary to conduct the acceptance tests. The method of testing shall be approved by the Architect/Engineer.

3. Visually inspect all cabling and termination points to ensure that they are complete and conform to the wiring pattern defined herein. Provide the Architect/Engineer with a written certification that this inspection has been made.

4. Conduct acceptance testing according to a schedule coordinated with the Owner/Architect/Engineer. Representatives of the Owner may be in attendance to witness the test procedures. Provide a minimum of one (1) week's advance notice to the Architect/Engineer to allow for such participation. The notification shall include a written description of the proposed conduct of the tests, including copies of blank test result

sheets to be used.

5. Tests related to connected equipment of others shall only be done with the permission and presence of the Contractor involved. The Contractor shall ascertain that testing only is required to prove the wiring connections are correct.

6. Provide test results and describe the conduct of the tests including the date of the tests, the equipment used, and the procedures followed. At the request of the Architect/Engineer, provide copies of the original test results in their native format.

7. All cabling shall be 100% fault-free unless noted otherwise. If any cable is found to be outside the specification defined herein, that cable and the associated termination(s) shall be replaced at the expense of the Contractor. The applicable tests shall then be repeated.

8. Should it be found by the Architect/Engineer that the materials or any portion thereof furnished and installed under this Contract fail to comply with the specifications and drawings with respect or regard to the quality, amount, or value of materials, appliances, or labor used in the work, it shall be rejected and replaced by the Contractor and all work disturbed by changes necessitated in consequence of said defects or imperfections shall be made good at the Contractor's expense.

    a. CAT 6A Cable:

        1) Testing shall be from the modular jack at the information outlet to the modular patch panel in the communication equipment room.

        2) Horizontal cable shall be free of shorts within the pairs and be verified for continuity, pair validity and polarity, and conductor position on the modular jack (e.g., wire map). Any defective, split, or mis-positioned pairs must be identified and corrected.

        3) CAT 6A horizontal cable shall be tested to 500 MHz as defined by TIA/EIA-568-C.2. Measurements shall be of the "Permanent Link"["Channel Link"], including [patch cords,] cabling, and modular jacks at the information outlet and modular patch panel. Parameters to be tested must include:

            a) Wire Map

            b) Length

            c) NEXT Loss (Pair-to-Pair)

            d) NEXT (Power Sum)

            e) ELFEXT (Pair-to-Pair)

            f) ELFEXT (Power Sum)

            g) Return Loss

h) Attenuation

i) Propagation Delay

j) Delay Skew

4) The maximum length of horizontal cable shall not exceed 295 feet, which allows 33 feet for technology equipment and modular patch cords.

5) To establish testing baselines, cable samples of known length and of the cable type and lot installed shall be tested. The cable may be terminated with an eight-position CAT 6A modular connector (8-pin) to facilitate testing. Nominal Velocity of Propagation (NVP) and nominal attenuation values shall be calculated based on this test and be used during the testing of the installed cable plant. This requirement can be waived if NVP and nominal attenuation data is available from the cable manufacturer for the exact cable type under test.

6) CAT 6A horizontal cable testing shall be performed using a test instrument designed for testing to 500 MHz or higher. Test records shall verify "PASS" on each cable and display the specified parameters, comparing test values with standards based "templates" integral to the unit. Test records that report a PASS*, FAIL*, or FAIL result for any of the parameters will not be accepted.

7) In the event results of the tests are not satisfactory, the Contractor shall make adjustments, replacements, and changes as necessary and shall then repeat the test or tests that disclosed faulty or defective material, equipment, or installation methods, and shall make additional tests as the Architect/Engineer deems necessary at no additional expense to the project or user agency.

2.2 DOCUMENTATION/AS-BUILTS/RECORDS

A. General:

1. Upon completion of the installation, submit as-builts per the requirements of Section 27 05 00 and Division 1. Documentation shall include the items detailed in the subsections below.

2. All documentation, including hard copy and electronic forms, shall become the property of the Owner.

3. The Architect/Engineer may request that a 10% random field retest be conducted on the cable system at no additional cost to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the Contractor, additional testing can be requested to the extent determined necessary by the Architect/Engineer, including a 100% retest. This retest shall be at no additional cost to the Owner.

B. Copper Media Test Data:

1. Test results shall include a record of test frequencies, cable type, conductor pair and cable (or Outlet) I.D., measurement direction, test equipment type, model and serial number, date, reference setup, and crew member name(s).

2. Printouts generated for each cable by the wire test instrument shall be submitted as part of the documentation package. The Contractor shall furnish this information in electronic form (USB thumb drive). The thumb drive shall contain the electronic equivalent of the test results as defined by the bid specification and be in the tester's native format as well as summaries of each test in pdf format. Provide a licensed copy of the software required to view and print the data that is provided in a proprietary format. Furnish one (1) copy of the data and display (if applicable) software.

C. Record Drawings:

1. The drawings are to include cable routes and outlet locations. Outlet locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 27 17 20

STRUCTURED CABLING SYSTEM WARRANTY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section describes support and warranty requirements relating to the structured cabling system and related subsystems.

1.2 RELATED WORK

A. Section 27 05 00 - Basic Technology Systems Requirements.

B. Section 27 11 00 - Communication Equipment Room (CER).

C. Section 27 15 00 Horizontal Cabling Requirements.

1.3 QUALITY ASSURANCE

A. Refer to Section 27 05 00 for relevant standards.

1.4 SUBMITTALS

A. Under the provisions of Section 27 05 00 and Division 1, prior to close of the project the Contractor shall submit:

1. A numbered certificate from the manufacturing company registering the installation.

PART 2 - PRODUCTS

2.1 WARRANTY

A. A twenty-five (25) year Product Installation Warranty and System Assurance Warranty shall be provided for the structured cabling system as described in the contract documents.

B. The Product Installation Warranty shall cover the replacement or repair of the defective product(s) and labor for the replacement or repair of such defective product(s).

C. The system assurance warranty shall cover the failure of the wiring system to support the application it was designed to support, as well as additional applications introduced in the future by recognized standards or user forums that use the TIA/EIA 568A component and link/channel specifications for cabling.

D. Upon successful completion of the installation and subsequent inspection, the Owner shall be provided with a numbered certificate from the manufacturing company registering the installation.

PART 3 - EXECUTION

3.1 WARRANTY REQUIREMENTS

A. This Contractor shall be responsible for providing, installing and testing a structured cabling system that will meet the manufacturer's warranty requirements.

END OF SECTION

SECTION 27 41 00 - PROFESSIONAL AUDIO/VIDEO SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. System Components

B. Audio Cabling

C. Digital Video Cabling

D. Control Cabling

E. Horizontal Copper Cabling and Connectors

1.2 RELATED WORK

A. Section 26 05 33 - Conduit

B. Section 26 05 13 - Wire and Cable

C. Section 27 05 00 - Basic Communications Requirements

D. Section 27 05 26 - Communications Bonding

E. Section 27 05 03 - Through Penetration Firestopping

F. Section 27 11 00 - Communication Equipment Rooms

G. Section 27 05 28 - Interior Communications Pathway

H. Section 27 15 00 - Horizontal Cabling Requirements

1.3 QUALITY ASSURANCE

A. Manufacturer: The manufacturer of equipment shall have a complete service organization for all products in the manufacturer's line.

B. Integrator/Dealer: The Contractor shall be a factory-authorized and certified integrator/dealer specializing in each selected manufacturer's products, with demonstrated prior experience with the selected manufacturer's system installation and programming.

C. The following qualifications have been endorsed by the AudioVisual and Integrated Experience Association (AVIXA), which is formerly known as InfoComm International.

1. The Contractor shall obtain the services of a Certified Technology Specialist with a specialized Installation endorsement (CTS-I) and a Certified Technology Specialist with a specialized Design endorsement (CTS-D) supervising the project. In addition to supervising the project, the CTS-I shall perform the following tasks on the project:

a. Review submittals and provide a letter stating the submittals are in compliance with the contract documents.

b. Provide written and dated confirmation of an observation of the contractor's installation activities no less than every 2 weeks month during the construction period.

c. Provide a final written and dated confirmation of a final construction review prior to testing.

d. Review final testing and calibration of the systems and provide a letter with the documented results or transmittal of the results stating the test results and calibration compliance with the contract documents.

D. A certification of CCENT or CCNA from CISCO. CCNP certification satisfies either of these requirements.

E. The Contractor shall have in-house or retain the services of a Microsoft Certified Systems Engineer (MCSE) or equivalent technician for the purposes of server deployment, software configuration, and system integration for those systems that reside in a Microsoft environment.

F. This project uses a video over IP AV solution and will require that the Contractor be proficient in distribution of video over an IP network. Aurora Multimedia is the basis of design. The Contractor is required to have the following certification requirements to support the system:

1. Software Defined Video over Ethernet (SDVoE) Design Certification.

G. The Contractor(s) shall provide a résumé of prior experience in similar types and scales of projects, and other projects that may have been completed with the client. The résumé shall include the project name, square footage, budget, system descriptions, and references with email addresses and phone numbers.

H. Control System Dealer: The media control system shall be provided, terminated, installed, and programmed by a factory-authorized and certified dealer and integrator in good standing with the manufacturer. The dealer shall have direct purchasing and support authority. These services shall not be subcontracted.

I. Control System Programmer: The media control system shall be programmed by a factory-trained and certified programmer.

1. Should the installer of the system not employ a factory-trained and certified programmer, a representative from the equipment manufacturer or certified independent programmer shall be retained for programming services. The Contractor shall be responsible for payment of programming services until the job is complete and signed off.

2. The Contractor shall have all certifications required by the manufacturer(s) for the installed system components on staff for the appropriate duties and responsibilities required by the manufacturer.

a. The control system programmer shall have all refresher courses completed for the latest features of the control platform prior to bidding the project to ensure that the Contractor is up to date with the latest software features.

b. The control system programmer shall have achieved the highest programmer level obtainable by the installed control manufacturer (e.g., master programmer).

3. The Contractor shall be fluent in the control systems preferred language (e.g., Python, C#, Java, JavaScript, SQL, PHP, etc.) required to complete the programing requirements of the AV system.

a. Other languages may be required to integrate with other systems, such as the HVAC and lighting system. The Contractor shall hire the services of a certified contractor to program these other systems as required by the manufacturer of these other systems.

J. Audio System Programmer: All digital sound processing equipment (DSP) used on the project shall be setup, programmed and calibrated by a factory-trained and certified technician. The audio system programmer shall have the following complementary certifications:

1. Associated manufacturer certifications

2. Dante Level III

K. Video System Programmer: All video distribution and processing used on the project shall be setup, programmed and calibrated by a factory-trained and certified technician.

L. The Contractor shall employ an ISF (Imaging Science Foundation) Level I, Level II certified video calibration specialist on staff to perform the calibration of the projectors and displays.

M. The Contractor shall have acquired and maintained all certifications for a minimum of one (1) month prior to the posted bid date of this project.

N. Servicing Contractor: The installer must be factory certified to provide service on the installed manufacturer's equipment and must have local service representatives within a 100 mile radius of the project site.

1.4 REFERENCES

A. ADA - Americans with Disabilities Act

B. ADAAG - Americans with Disability Accessibility Guidelines

C. ANSI - American National Standards Institute

D. BICSI – Building Industry Consulting Service International, Inc.

E. IBC - International Building Code

F. IEC - International Electrotechnical Commission

G. NFPA 70 - National Electrical Code (NEC)

H. UL 813 - Commercial Audio Equipment

I. UL 1419 - Professional Video and Audio Equipment

J. UL 1492 - Audio/Video Products and Accessories

K. CBC - California Building Code (Current Version)

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 27 05 00.

B. General Requirements:

1. Submittals will be submitted in multiple passes over the course of construction. Each pass will be a dedicated single submission for review as outlined in the general submittal requirements outlined in section 27 05 00.

2. Upon acceptance of an item in the submittal, the Contractor shall remove them from future resubmittals of the same submittal "pass".

3. Should the Contractor not provide shop drawings in a timely fashion, not complete requirements, or extend the time of any resubmittals so as to jeopardize schedules, cause delay, or limit access for field work, the Contractor bears responsibility for impact and delay that may occur. This includes access or lift to overhead positions and associated protection of work already in place.

C. First Pass Submittals: To be submitted after the project is awarded but before equipment is submitted, purchased and installed.

1. Contractor(s) résumé of qualifications.

2. All certifications shall be current and valid. Any certificate with expired dates will not be accepted.

3. All applicable AudioVisual and Integrated Experience Association (AVIXA) certifications. Qualifications from InfoComm that have not expired will be accepted.

4. All certifications outlined in the qualifications shall be included in this submittal. Refer to the qualifications section for additional information. Certifications include, but are not limited to:

a. All installed manufacturer certifications required by the manufacturer.

b. Control system authorized dealer certification.

c. Control system certified programmer certification(s).

d. Audio system DSP dealer certification.

e. Audio system DSP programmer certification.

f. Professional audio components dealer certification(s).

g. Video system dealer certification(s).

h. Video conferencing dealer certification(s).

i. All other applicable dealer, installation and programming certifications.

j. All applicable Microsoft certifications.

k. All applicable networking certifications.

5. If an alternate manufacturer(s) is submitted, the equivalent certifications to the basis of design manufacturer(s) shall be required and submitted.

6. Audio and video calibration equipment certifications.

7. Audio and video testing and calibration equipment and software procedures and manufacturer-specific equipment calibration certificates.

D. Second Pass Submittals: To be submitted after all initial submittals have been approved but before equipment is purchased, installed, configured, and programmed.

1. Alternate System Drawings: If an approved alternate manufacturer is submitted, the Contractor shall provide project-specific system CAD drawings. These will be required to be submitted with the product data.

a. Provide a system block diagram noting system components and interconnection between components. The interconnection of components shall clearly indicate all wiring required in the system. When multiple pieces of equipment are required in the exact same configuration (e.g., multiple identical controllers), the diagram may show one device and refer to the others as "typical" of the device shown.

2. Product Data: Provide manufacturer's technical product specification sheet for each individual component type. Submitted data shall show the following:

a. Compliance with each requirement of these documents.

b. All component options and accessories specific to this project.

c. Electrical power consumption rating and voltage.

d. Wiring requirements.

e. Pre-terminated cable distances and requirements identified by each room where required.

f. Product manuals are not an acceptable format and will be rejected.

3. Available wireless microphone frequencies within a 50 mile range based on the submitted system(s) and coordinated with the number of channels.

E. Final Pass Submittals: To be submitted after all initial submittals have been approved but before the equipment is installed, configured and programmed. These should not be submitted until after the pre-installation meeting outlined in Part 3.

1. System Drawings: Project-specific system drawings shall be provided as follows:

    a. Provide a system block diagram noting system components and interconnection between components. The interconnection of components shall clearly indicate all wiring required in the system. When multiple pieces of equipment are required in the exact same configuration (e.g., multiple identical controllers), the diagram may show one device and refer to the others as "typical" of the device shown.

    b. Submittals shall contain shop drawings indicating physical plan locations and placement of installed devices and accessories with associated scope or field conditions for review and coordination. Provide mounting details, suspensions, and rough-in notes with trade demarcations.

        1) Identify any non-standard back boxes or mounting assembly required by product or specifications and elaborate contractor means and methods for mounting.

        2) Provide rack drawing(s) showing the mounting of equipment in each rack or cabinet on the project.

        3) All display mounts shall be coordinated with the Architect to verify the exact vertical and horizontal positioning of the display. Coordinate in-wall stud locations for installation of recessed display mounts to install in the exact location as coordinated with the architectural drawings.

        4) In-ceiling speakers, in-ceiling microphones, and all other above ceiling devices shall be coordinated with other trades in the field (e.g., mechanical ductwork, lights, diffusers, etc.) to minimize changes that will impact the performance of the system design.

    c. Submit wiring and cable path requirements, including field wiring, path verification, signal separation, and outside diameter of cables for conduit sizing and verification that can be used for field installation and electrical coordination.

    d. Reproduction of contract documents is not acceptable for submittals. Wire CAD type drawings and cable tag lists or schedules, or typical manufacturer's abbreviated single lines alone, are not complete.

2. The Contractor shall submit graphic or emulated representations of the control system touch panels for each unique space and layout prior to purchase, installation and programming for review and comment by the Architect/Engineer and Owner. These shall show and describe the intended programming/macro control features and functions of each button/icon for all pages.

3. The Contractor shall submit graphic or emulated representations of the control system keypads for each unique space and layout prior to purchase, installation and programming for review and comment by the Architect/Engineer and Owner. These shall show and describe the intended programming/macro control features and functions of each button/knob.

4. The Contractor shall submit the actual DSP audio processor files or single line audio path

file diagram prior to installation for review and comment by the Architect/Engineer. Provide preliminary settings with processor blocks identified and note resources allocated.

5. The Contractor shall submit the number of IP addresses, VLANS, and subnetworks that will be required from the Owner's Information Systems Department.

6. Provide system checkout and commissioning procedure to be performed at acceptance.

    a. The A/E provides electro-acoustic and technical testing including punch list on behalf of the Owner for final performance verification and optimization of the systems. The AVC shall include a site test allowance in the bid for A/E Commissioning and testing services.

    b. AVC shall provide two (2) week written advance notice to the Prime Contractor for the A/E and schedule a minimum of one "quiet day" on the CM project schedule chart for A/E electro-acoustic testing, when project nears Substantial Completion and loudspeakers are properly aimed.

        1) A "quiet day" means General Contractor activity may proceed in certain areas, but A/E shall retain the ability to call off any noise or intrusive construction activity in the main seat area for noise control measurements and main loudspeaker testing as required. This is at the will of the site acoustician and AV Commissioning Firm (A/E).

        2) A test report and pre-commissioning check list shall be filed by AVC prior to scheduling A/E performance verification.

7. Submit meeting agenda for planning/programming meetings as required in Part 3 of this specification.

8. Submit detailed description of Owner training to be conducted at project end, including specific training times and typical attendees expected.

9. Provide rack drawing(s) showing the mounting of equipment in each rack or cabinet on the project. Rack drawings shall include the following:

    a. Equipment placement including mounting on the front or rear of the rack.

    b. Spacing separation as required by equipment for adequate airflow and heat dissipation.

    c. Signal separation based on AVIXA standards as required by the design.

    d. Heating/cooling load requirements for submitted equipment to verify the heating/cooling load of the rack. This shall include Owner-provided equipment coordinated with the Owner.

    e. Power requirements for each rack including plug type and loads based on the final approved products.

10. A console and equipment rack plan shall be provided showing console, countertop, rough-

in, cable paths, and wall plates with dimensions in plan view and elevation. The plan shall include equipment layout within the console and rack.

11. Submit the detailed engineered and coordinated mounting solution(s) for wall-mounted and ceiling-mounted devices including the following items:

    a. In-ceiling speakers.

    b. Video displays including blocking or ceiling span requirements, height from finished floor, and back box location.

12. Submit engineered PE stamped rated rigging solution(s) for performance loudspeakers, including, but not limited to, the following items:

    a. Provide PE stamped shop drawings that detail suspension means and methods including rated loudspeaker rigging components, attachments, supplemental spans, and independent safety cables. Note load for each location.

    b. Clearly note and confirm the XYZ "reference" point being used on floor plans ("0" point) for determining proper aim, horn rotation, location, heights and clearance of main speakers. Refer to Loudspeaker Aim Schedule and confirm XYZ location and aim angle for each loudspeaker device. Verify clear sightline from speaker to aim point. Notify A/E of any anticipated conflicts.

13. If an alternate loudspeaker design is going to be utilized, the Contractor shall submit the following sets of calculations:

    a. EASE Calculations:

        1) All calculations shall be completed at a minimum patch size resolution of 1.00ft at 1/3 octave, 35ms split time, and shown with Summed Interference and Map with Shadow turned on. The calculations shall be submitted electronically as EASE OpenGL (*.egl) files. The Contractor shall also provide a copy of the latest version of the EASE GLL viewer to view the electronic EASE files.

        2) Provide coverage maps (print or pdf) for each main loudspeaker and combined composite of all main loudspeakers as Direct SPL at 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, 8000 Hz, and three octave mid-band sum centered at 2000 Hz.

        3) Articulation Loss of Consonants (ALCons).

        4) Calculated Speech Transmissible Index (STI) using the Modulation Transfer Index (MTI) with noise levels.

        5) The Contractor shall use the latest version of EASE.

        6) The Contractor shall refer to the architectural drawings and specifications for room geometry, room dimensions and surface finishes.

        7) The Contractor shall use a listener sitting height of four (4) feet for rooms where the primary function will be sitting. The Contractor shall utilize a

listener standing height of five feet three inches (5.25') for rooms where the primary function will be standing.

8) The Contractor shall use a standard indoor temperature of 68°F, 60% humidity and a standard pressure of 29.8 Hg, unless more specific data is available.

9) The Contractor shall submit packed electronic EASE files or an EASE generated list of materials and room data for review and approval by the Architect/Engineer.

F. Discontinued Products and New Model Releases:

1. For each product, the Contractor shall submit (in addition to the specified product) a product cut sheet if the specified product has been replaced, improved upon, phased out or otherwise upgraded at the time of shop drawing submittal.

a. The intent of this requirement is for the Contractor to submit only direct replacements for the specified products. A direct replacement shall be defined as a product of newer release that has equal or greater capabilities, which is available for not more than a 10% premium over the specified product's bid unit cost.

b. It is not the intent of this requirement for the Contractor to submit new products or other product options that significantly differ in capability and/or cost from the specified product.

G. Coordination Drawings:

1. Include all ceiling-mounted devices in composite electronic coordination files. Refer to Section 27 05 00 for coordination drawing requirements.

1.6 SYSTEM DESCRIPTION

A. This specification section describes the furnishing, installation, commissioning and programming of audio/video components and systems.

B. Performance Statement: This specification section and the accompanying Contract Documents are performance based, describing the minimum material quality, required features, and operational requirements of the system. These documents do not convey every wire that must be installed, every equipment connection that must be made and every feature and function that must be programmed and configured. Based on the equipment constraints described and the performance required of the system, as presented in these documents, the Vendor and the Contractor are solely responsible for determining all wiring, programming and miscellaneous equipment required for a complete and operational system.

C. This document describes the major components of the system. All additional hardware, subassemblies, supporting equipment and other miscellaneous equipment required for proper system installation and operation shall be provided by the Contractor.

D. This document describes the major programming features and functions of the system. All additional programming, configuration and integration required for proper system installation and operation shall be provided by the Contractor.

E. When a specific manufacturer is not provided in this document for minor pieces of equipment, the Contractor shall provide only those materials considered to be of the same industry commercial and professional quality level as the major equipment manufacturers.

F. General System Description:

1. The purpose of this section is to define the overall AV system requirements for existing EOC identified on the project drawings. This is to represent the end-user needs, applications, tasks and Functions and features for each space to assist with identifying programing requirements for each space.

2. The basis of design control platform for the system is Crestron. This includes touch panels and other means to control the AV within the space. The control system will be managed by an on-premise server. This will communicate with on-premise hardware. The touch panel with have the capabilities to control the following in addition to the individual requirements outlined for each space:

a. AV system Control

b. Flat Panel Control

c. Audio system Control

G. Room Type Requirements:

1. General System Requirements:

a. Architectural and Infrastructure Requirements:

1) The contractor shall consider the architectural "appeal" when installing any device.

2) Coordinate with architect on required blocking for wall-mount displays.

3) Coordinate mounting of equipment with studs and furniture to align with the display mounts.

b. Electrical Requirements:

1) Coordinate any power needs with the electrical contractor. Some devices use power over ethernet (PoE). If local power is required, coordinate with electrical contractor. The contractor shall be responsible to field verify power requirements and loads with the electrical contractor prior to installation.

2) Provide recessed AV back box at flat panel displays as indicated on the drawings.

2. Emergency Operations Center (EOC):

a. Design Requirements:

1) The EOC shall provide support for meetings, and wired and wireless

presentation/collaboration.

b. Video Systems:

1) Large format video display with video conferencing.

2) Input for local source.

3) A/V switching system.

4) PTZ cameras.

c. Audio System:

1) Ceiling speakers.

2) Wireless microphone.

3) Input for local source.

d. Control System:

1) Dedicated control panel with touch interface.

e. System Requirements:

1) Provide six (6) ceiling mounted speakers.

2) Provide one (1) 110" TV flat panel displays mounted on the front wall and two (2) 4K LED flat panel display on the south wall.

3) On plan south wall, provide wall-mount touch panel for control of display.

4) Provide a second touch panel for AV control in the EOC room to avoid a single point of failure. The second touch panel will be provided on the front wall.

5) Provide (2) conference cameras with each one located on each side of the walls, with a display.

6) Provide microphones.

7) Provide 2 TVs at south wall of EOC 102 Rm to be 65” min

8) Provide new pull-out swivel brackets

9) New 110” TV needs a fixed / tilt bracket only (pull-out swivel not needed)

10) Provide an equipment rack for the systems' permanently mounted equipment within existing rack.

11) Provide a control system with touch screen control panel.

12) The control system to provide control for:

a) System on/off

b) Audio and/or video source and destination selection

c) Audio level

d) Source on/off

e) Transport/channel control

f) Codec functions such as camera control, dialup, address book, etc.

H. System Room Drawing Reference: AV SYSTEM

ROOM DESCRIPTION/NAME	FUNCTIONAL DRAWING
EOC	1/T-003

1.7 LICENSING REQUIREMENTS

A. All user licenses required for system operation shall be included in the Contractor's bid. User licenses shall include, but not be limited to, server and workstation software and any other licensing that is required by the manufacturer for operation of any system component.

1. Licenses shall be provided on a one-to-one basis. One license shall be provided for each server, workstation, and device requiring a license. In the event the manufacturer requires the purchase of a block of licenses, the minimum standard licensing package to support all devices shall be provided.

1.8 INTELLECTUAL PROPERTY OWNERSHIP

A. All supporting documentation, programming, uncompiled source code, graphic files, DSP code and diagrams, written and electronic files, including all latest versions of the documentation and software necessary to edit and adapt the system(s), shall be provided to the Owner for all spaces and all systems. The integrator and/or programmer shall also maintain a current copy to be provided at the Owner’s request.

1. The Owner shall have the right to modify the intellectual property directly, or to have the intellectual property modified by any party of the Owner's choosing.

1.9 PROJECT RECORD DOCUMENTS

A. Submit documents under the provisions of Section 27 05 00.

B. Provide all applicable certifications.

C. Provide statement that system checkout test, as outlined in the shop drawing submittal, is complete and satisfactory.

D. Provide schedules documenting all terminal block wiring, including cable numbers.

E. Warranty: Submit written warranty and complete all Owner registration forms.

F. Complete all operation and maintenance manuals as described below.

G. The Contractor shall include all factory-provided test results for equipment installed on the project.

H. The Contractor shall include all test results from system demonstration and performance testing specified in this document.

I. Record Drawings shall minimally include:

1. All revisions to, or deviations from the original drawings, as well as final dimensions, cable routes, connector panel drawings, cable numbering charts, and control system programming documentation. A complete as-installed equipment list, listed by room, and with manufacturers' names, model numbers, serial numbers, and quantities of each item.

2. A complete and correct system schematic, showing detailed connections for all parts of

the system, including wire numbers, terminal block numbers and layouts, and other designations and programming code.

3. Complete equipment rack layouts showing locations of all rack-mounted equipment items.

4. Additional information, diagrams or explanations as designated under respective equipment or systems specification section.

J. Within each equipment room, the appropriate floor plan for which that equipment room serves shall be laminated and mounted for use by the Owner. Functional drawings shall be posted at each AV closet or included at every AV rack within a room.

K. Upon completion and final acceptance of the project, the Contractor shall provide the Owner a copy of the programming code for any and all AV systems and devices programmed by the Contractor.

1. For any subsequent modifications to the programming code, an updated copy of the code shall be provided to the Owner.

1.10 UNIT PRICES

A. Contractor shall provide a unit price for the following pieces of equipment:

B. Unit costs shall indicate material, installation and programming costs separately.

1.11 OPERATION AND MAINTENANCE DATA

A. Submit documents under the provisions of Section 27 05 00.

B. Manuals: Final copies of the manuals shall be delivered after completing the installation. Each manual's contents shall be identified on the cover. The manual shall include names, addresses, and telephone numbers of the Contractor responsible for the installation and maintenance of the system and the factory representatives for each item of equipment for each system. The manuals shall have a table of contents and labeled sections. The final copies delivered after completion of the installation shall include all modifications made during installation, checkout, and acceptance. Manuals shall be submitted in electronic format. The manuals shall consist of the following:

1. Functional Design Manual: The functional design manual shall identify the operational requirements for the system and explain the theory of operation, design philosophy, and specific functions. A description of hardware and software functions, interfaces, and requirements shall be included.

2. Hardware Manual: The manual shall describe all equipment furnished including:

a. General description and specifications.

b. Installation and checkout procedures.

c. Equipment layout and electrical schematics to the component level.

d. System layout drawings and schematics.

e. Alignment and calibration procedures.

f. Manufacturers repair parts list indicating sources of supply.

3. Software Manual: The software manual shall describe the functions of all software and shall include all other information necessary to enable proper loading, testing, and operation. The manual shall include:

a. Definition of terms and functions.

b. System use and application software.

c. Initializations, startup, and shutdown.

d. Reports generation.

e. Details on forms customization and field parameters.

4. Operator's Manual: The operator's manual shall fully explain all procedures and instructions for the operation of the system including:

a. Computers and peripherals.

b. System startup and shutdown procedures.

c. Use of system, command, and applications software.

d. Recovery and restart procedures.

e. Use of report generator and generation of reports.

f. Data entry.

g. Operator commands.

h. Alarm messages and reprinting formats.

i. System permissions functions and requirements.

5. Maintenance Manual: The maintenance manual shall include descriptions of maintenance for all equipment including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.

C. Intellectual Property Ownership: Provide all uncompiled source code and DSP programming for all systems and spaces as described in Part 3 of this specification section.

1.12 WARRANTY

A. Unless otherwise noted, provide warranty for one (1) year after Date of Substantial Completion for all materials and labor.

B. Onsite Work During Warranty Period: This work shall be included in the Contractor's bid and performed during regular working hours, Monday through Friday.

1. Inspections: The Contractor shall perform two (2) minor inspections at even intervals (or more often if required by the manufacturer), and two (2) major inspections offset equally between the minor inspections.

2. Minor Inspections: These inspections shall include:

a. Visual checks and operational tests of all equipment, field hardware, and electrical and mechanical controls.

b. Mechanical adjustments if required on any mechanical or electromechanical devices.

C. Operation: Upon the performance of any scheduled adjustments or repairs, Contractor shall verify operation of the systems.

D. Emergency Service: The Owner will initiate service calls when the systems are not functioning properly. Qualified personnel shall be available to provide service within the distance defined within this specification section. The Owner shall be furnished with telephone number(s) where service personnel can be reached 24/7/365. Service personnel shall be at site within 24 hours after receiving a request for service.

E. Records and Logs: The Contractor shall keep records and logs of each task completed under warranty. The log shall contain all initial settings at substantial completion. Complete logs shall be kept and shall be available for review on site, demonstrating that planned and systematic adjustments and repairs have been accomplished for the systems.

F. Work Requests: The Contractor shall separately record each service call request on a service request form. The form shall include the model and serial number identifying the component involved, its location, date and time the call was received, specific nature of trouble, names of service personnel assigned to the task, instructions describing what must be done, the amount and nature of the materials used, the time and date work started, and the time and date of completion. The Contractor shall deliver a record of the work performed within five (5) business days after work is accomplished.

G. System Modifications: The Contractor shall make any recommendations for system modification in writing to the Owner. No system modifications shall be made without prior approval of the Owner. Any modifications made to the system shall be incorporated into the operations and maintenance manuals, and other documentation affected. To the fullest extent possible, the Owner shall be provided with electronic restorable versions of all configurations prior to the modifications being made.

H. Software: The Contractor shall provide all software and firmware updates during the period of the warranty and verify operation of the system upon installation. These updates shall be accomplished in a timely manner, fully coordinated with system operators, shall include training for the new changes/features, and shall be incorporated into the operations and maintenance manuals, and software documentation.

I. Refer to the individual product sections for further warranty requirements of individual system

components.

PART 2 - PRODUCTS

2.1 QUALITY OF PRODUCTS

A. Materials and equipment specified herein have been selected based upon original overall requirements of the project.

1. Each material, device or piece of equipment provided herein shall comply with all of the manufacturer's published specifications for that item.

2. Equipment shall be from the manufacturer's current stock and shall not be stored longer than (1) one year.

B. All materials and products will be new and of professional quality. Unless specifically stated in the drawings or specifications, no existing or used materials will be installed.

2.2 BASIS OF DESIGN: Crestron products.

2.3 BILL OF MATERIALS:

Item	Qty	Model	Description
1	3	DM-NVX-360 for Displays	DM NVX 4K60 4:4:4 HDR Network AV Encoder/Decoder
2	1	AM3-212 KIT	AirMedia® Series 3 Kit with AM-3200-WF Receiver, two AM-TX3-10 Adaptors, and Cradle
3	1	CCC-110-T	Crestron Collab Compute with the Intel® Core™ Ultra 5 for Microsoft Teams® Rooms Software
4	1	UC-COLLABCARE-1YR	Crestron Collab Care Premium Support for Crestron Collab Compute and Dedicated TS(W)-1080-UC Touch Screens
5	2	TSW-1080-UC-B	10.1 in. Wall Mount Touch Screen, Unified Communication Version
6	1	IV-CAM-I12-B	Multi-camera mode Crestron 1 Beyond i12 Intelligent PTZ Camera, 12x Optical Zoom, Moon Gray
7	1	IV-CAM-P20-B	Crestron 1 Beyond p20 PTZ Camera, 20x Optical Zoom, Moon Gray
8	1	IV-CAMA-UMB-B	Crestron 1 Beyond Universal Mount Bracket, Moon Gray
9	1	USB-EXT-2-REMOTE-1G-B	USB over Category Cable Extender Wall Plate, Remote, Black
10	1	USB EXT-2-LOCAL	USB over Category Cable Extender, Local
11	1	AMP-X300	X-Series Amplifier, 300 W
12	6	SAROS IC6T-W-T-EACH+	Saros® 6.5 in. 2-Way In-Ceiling Speaker, White Textured,Single (must be ordered in multiples of 2)
13	1	CP4N	4-Series™ Control System
14	1	DMF-CI-8	DigitalMedia Card Chassis for DM-NVX-C & DMCF, 8 Slots
15	2	DM-NVX-E30C	DM NVX 4K60 4:4:4 HDR Network AV Encoder Card
16	1	DM-NVX-360C	DM NVX 4K60 4:4:4 HDR Network AV Encoder/Decoder Card
17	1	DM-NVX-E20-2G-B-T	DM NVX 4K60 4:2:0 Network AV Encoder, Wall Plate, Black Textured
18	1	CEN-SWPOE-26	26 Port PoE+ Network Switch
19	1	AUDIO DSP	Audio Conferencing Processor
20	1	MICROPHONE	SHURE MXA920

2.4 SYSTEM COMPONENTS

A. Refer to the project drawings for basis of design system components. Equivalent products shall meet or exceed all requirements defined on the project drawings. The following product information represents the minimum additional requirements for equivalent products:

B. Audio/Video GUI Control Systems:

1. Contractor shall furnish a programmable software-based audio/video control system. The system shall be field configurable and programmable by the factory and/or a factory-trained programmer.

2. The control system shall be TCP/IP based allowing direct connection of the system processors to a 10/100BaseT compatible Ethernet network.

3. The control system(s) shall connect to a centralized software-based management system for central control, monitoring and statistical information.

4. Virtual touch panel shall be provided for remote trouble shooting and control.

5. Refer to project drawings for required central processors, touch panels, and additional information.

C. Microphone Systems:

1. Wireless Microphones.

D. Audio Amplifiers:

1. Power Amplifier(s), 25, 70.7 and 100 Volt:

a. Power: The following calculation shall be used to determine the minimum required output of the amplifier(s):

1) Calculate the total power tap value of each transformer with insertion loss using the following equation:

a) Tap wattage x 10^(xdB/10) where x = the rated insertion loss at 1,000Hz.

2) Calculate the total wattage loss based on cable distance, cable gauge and cable resistance.

3) Add together all the speaker taps' total power values that will be on a single channel of the amplifier. Multiply that total by 1.2, which will allow for a 20% future expansion. Multiply that number by 1.25 to ensure the amplifier never exceeds 75% of its total output. Utilize the final number to determine the minimum amplifier power requirements.

2.5
2.5

2.5 AUDIO CABLING

A. Refer to Section 27 05 00 for cable rating requirements.

B. Constant Voltage Speaker Cabling:

1. Class 2, stranded, twisted, 2-conductor, minimum of 16-gauge wire for all 25/70.7/100-volt applications unless noted otherwise.

2. The Contractor shall size cabling as required for distance power and shall provide larger gauge cable as required.

3. Manufacturers:

a. Belden

b. Liberty

c. Or pre-approved equal

C. High Performance Constant Voltage Speaker Cabling:

1. Class 2, stranded, twisted, minimum of 12-gauge wire for all 25/70.7/100-volt high wattage (50-watts per speaker or greater) applications unless noted otherwise.

2. The Contractor shall size cabling as required for distance power and shall provide larger gauge cable as required.

3. Manufacturers:

a. Belden

b. Liberty

c. Or pre-approved equal

4. The Contractor shall size cabling as required for distance power and shall provide larger gauge cable as required.

5. Cable shall be installed in conduit within plenum areas.

6. Manufacturers:

a. Belden

b. Liberty

c. Or pre-approved equal

2.6 DIGITAL VIDEO CABLING

A. All digital video cabling shall be pre-assembled and tested in a factory and not field terminated. The contractor shall field verify the cable distance and provide the proper cable type and length.

B. High Definition Multi-Media Interface (HDMI) "High Speed" Cable:

1. For any cable run that exceeds the manufacturer-recommended distances or fails to transmit video or audio due to cable length, the Contractor shall provide and install am HDCP-compliant signal equalizer at the far end (sink).

2. For cable runs less than or equal to 25 feet:

a. Four (4) 28AWG solid bonded twisted pairs for clock and data, and seven (7) 28AWG solid conductors for control.

b. Two Layer Shield:

1) Inner shield: non-bonded aluminum foil tape.

2) Outer shield: 85% tinned copper braid shield.

c. Nominal attenuation of clock and data pairs (per 100 feet): 1) at 100-MHz: 9.6 dB

2) at 400-MHz: 19.3 dB

3) at 825-MHz: 28.9 dB

4) at 1200-MHz: 36.1 dB

d. Nominal capacitance between shielded pairs: 15.3 pF/ft nominal.

e. Nominal capacitance between control pairs: 16.5 pF/ft nominal.

f. Nominal return loss of shielded pairs: 15 dB, 1-1200 MHZ.

g. Nominal shield DC resistance of individual shield: 24.4 ohms/1000 ft.

h. Nominal shield DC resistance of overall shield: 3.7 ohms/1000 ft.

i. The cable shall be HDMI 1.3a Category 1 certified to 25 feet, and HDMI 1.3a Category 2 certified to 15 feet.

j. Supports a maximum digital data rate of 10.2 Gbit/s.

k. Supports up to eight (8) channels of HD audio.

l. HDCP compliant.

m. Manufacturers:

1) Belden

2) Or pre-approved equal

3. For cable runs greater than 25 feet:

a. Four (4) 24AWG solid bonded twisted pairs for clock and data, and seven (7) 24AWG solid conductors for control.

b. Two Layer Shield:

1) Inner shield: non-bonded aluminum foil tape.

2) Outer shield: 82% tinned copper braid shield.

c. Nominal attenuation of clock and data pairs (per 100 feet): 1) at 100-MHz: 6.0 dB

1) at 400-MHz: 13.5 dB

2) at 825-MHz: 19.8 dB

3) at 1200-MHz: 24.1 dB

d. Nominal capacitance between shielded pairs: 15.3 pF/ft nominal.

e. Nominal capacitance between control pairs: 16.5 pF/ft nominal.

f. Nominal return loss of shielded pairs: 15 dB, 1-1200 MHZ.

g. Nominal shield DC resistance of individual shield: 15.0 ohms/1000 ft.

h. Nominal shield DC resistance of overall shield: 1.75 ohms/1000 ft.

i. The cable shall be HDMI 1.3a Category 1 certified to 45 feet, and HDMI 1.3a Category 2 certified to 25 feet.

j. Supports a maximum digital data rate of 10.2 Gbit/s.

k. Supports up to eight (8) channels of HD audio.

l. HDCP compliant.

m. Manufacturers:

1) Belden

2) Or pre-approved equal

C. Display Port Cable:

1. For any cable run that exceeds the manufacturer-recommended distances, the Contractor shall provide and install an HDCP and DPCP compliant signal equalizer at the far end (sink).

2. Supports a maximum digital data rate of 8.64 Gbit/s.

3. Supports HDCP and DPCP.

4. Manufacturers:

    a. Blue Jeans Cable

    b. Or pre-approved equal

D. High Definition Serial Digital Interface (HD-SDI) Cabling:

1. For patch cables less than or equal to 25 feet:

    a. RG-59, center conductor: 22 AWG stranded (7x29) bare copper, 0.023" OD (nominal), polyethylene dielectric.

    b. Single Layer Shield:

        1) Outer Shield: 98% tinned copper braid

    c. Nominal Impedance: 75 ohms

    d. Nominal Capacitance: 21.0 pF/Ft

    e. Velocity of Propagation: 66%

    f. Maximum Attenuation (per 100 feet):

        1) at 1-MHz: 0.3 dB

        2) at 71.5-MHz: 2.5 dB

        3) at 360-MHz: 6.0 dB

        4) at 750-MHz: 8.9 dB

        5) at 1000-MHz: 10.5 dB

    g. Manufacturers:

        1) Belden

        2) CommScope

        3) Liberty

        4) Extron

2. For horizontal cable runs less than or equal to 100 feet:

    a. RG-59, center conductor: 20 AWG solid bare copper, 0.031" OD (nominal), FEP insulation.

    b. Double Layer Shield:

1) Outer Shield: 95% tinned copper braid outside and bonded foil inside.

c. Nominal Impedance: 75 ohms

d. Nominal Capacitance: 16.1 pF/Ft

e. Velocity of Propagation: 83%

f. Maximum insertion loss (per 100 feet):

1) at 1-MHz: 0.3 dB

2) at 71.5-MHz: 2.1 dB

3) at 360-MHz: 4.4 dB

4) at 750-MHz: 6.5 dB

5) at 1000-MHz: 7.6 dB

g. Manufacturers:

1) Belden non-plenum or plenum

2) CommScope

3) Liberty

4) Extron

3. For horizontal cable runs greater than or equal to 100 feet:

a. For any cable run that exceeds the manufacturer-recommended distances or fails to transmit video or audio due to cable length, the Contractor shall provide and install a signal equalizer at the far end (sink).

b. RG-6, center conductor: 18 AWG solid bare copper, 0.274" OD (nominal),.

c. Double Layer Shield:

1) Inner Shield: 100% non-bonded aluminum foil tape

2) Outer Shield: 95% tinned copper braid

d. Nominal Impedance: 75 ohms

e. Nominal Capacitance: 15.9 pF/Ft

f. Velocity of Propagation: 84.5%

g. Maximum attenuation for non-plenum cable (per 100 feet):

1) at 1-MHz: 0.2 dB

2) at 71.5-MHz: 1.6 dB

3) at 360-MHz: 3.5 dB

4) at 750-MHz: 5.1 dB

5) at 1000-MHz: 5.9 dB

h. Manufacturers:

1) Belden

2) CommScope

3) Liberty

4) Extron

2.7 CONTROL CABLING

A. Control:

1. For Bidding Purposes: Two-pair, twisted, shielded, one (1) #18 AWG pair and one (1) #22 AWG pair. Provide with plenum-rated jacket where used in a plenum space without conduit.

2. Size conductors as required for distance and voltage drop.

3. Coordinate exact requirements with selected manufacturer and system prior to submitting bid.

B. Other Control Circuits:

1. #20 AWG, stranded, shielded cable, number of conductors as required for the applications. Provide with plenum-rated jacket where used in a plenum space without conduit. Provide PVC jacket where installed in conduit or non-plenum areas.

2. Coordinate exact requirements with selected manufacturers prior to submitting bid.

2.8 HORIZONTAL COPPER DATA AND CONNECTORS

A. Refer to Section 27 15 00 - Horizontal Cabling Requirements, for telecommunications cabling and connector requirements being utilized for A/V systems.

B. Refer to Section 27 17 10 - Testing, for telecommunications cabling testing requirements being utilized for A/V systems.

C. All category-rated copper data cabling shall be installed, terminated, tested and certified by the Division 27 Telecommunications contractor certified by the selected manufacturers for the copper cabling plant. The Contractor shall submit all cabling and certifications to the Architect/Engineer for approval in the shop drawings.

D. The A/V contractor shall coordinate purchase, installation, testing and certification with the telecommunications contractor for all required category-rated copper data cabling required for A/V system operation prior to bid.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Verify field dimensions and coordinate physical size of all equipment with the architectural requirements of the spaces into which they are to be installed. Allow space for adequate ventilation and circulation of air.

C. Verify that required utilities are available, in proper location, and ready for use.

D. Beginning of installation means installer accepts existing conditions.

3.2 PRE-INSTALLATION

A. A pre-installation meeting shall be held after the project has been awarded but before any submittals or work has been conducted. The purpose of this meeting is to review the drawings and specifications to assist with the construction and installation process that will occur during construction. The meeting will include the Engineer, Architect, Owner's Representative, and all relevant installing contractors for this system. The meeting will be chaired by the project manager for the AV contract and will include the following topics:

B. The Contractor shall be responsible for submitting all requested submittals and holding the pre-installation meeting prior to any purchasing, installation, programming, and construction coordination. Any delays or changes to the project as a result of meeting this requirement will be at the Contractor's expense.

3.3 INSTALLATION

A. Comply with the manufacturer's instructions and recommendations for installation of all products.

B. Provide all system wiring between all components as directed by the manufacturer or required for proper system operation.

C. Mount all touch screen and keypad devices where shown on plans in accordance with Americans with Disabilities Act (ADA) requirements for both side reach and front reach.

D. Cabling Requirements:

1. Non-plenum rated cabling may be used instead of plenum when installed with-in conduit in plenum rated areas.

2. All cabling shall be routed according to function. Cabling shall be grouped and bundled by groups, such as: microphone and line level audio, control, video and speaker. In no case shall cabling from different functional groups be intermixed. No cabling shall be routed parallel to 120 VAC or higher power circuits unless separated by a minimum of 6" and the 120 VAC or higher power is installed in conduit.

3. When cabling is installed in conduit, a separate conduit shall be provided for each cabling functional type.

4. Cable bundles shall be loosely bundled to allow the visual following of individual cables within the bundle and to permit the easy removal and addition of cables, as necessary.

5. Horizontal cabling installed as open cable or in cable tray shall be bundled at not less than 10’ intervals with hook-and-loop tie wraps. The use of plastic cable zip ties is strictly prohibited in any situation.

6. Cabling shall not be spliced under any circumstances.

7. Each cable shall be appropriately identified (as defined on the record documents) at each end's termination point using pressure sensitive label strips.

8. Audio Cabling:

   a. All amplified audio cabling shall not be in the same enclosed pathway as any other type of cabling as required by the NEC. Refer to the NEC for definitions and additional requirements.

   b. The polarity of all cabling shall remain consistent throughout the project, on all equipment. Red conductors shall be used for the positive "+" side, and black used for the negative "-" side.

   c. Cable shield length shall be equal to the cable's conductor length.

   d. All shielded cables drain wire SHALL be grounded and continuous throughout the entire length of the system, including splices where speakers are installed.

   e. Balanced audio connections shall be used whenever the mating equipment allows.

   f. Do not run unbalanced cables longer than 3m. For interconnecting of unbalanced equipment in lengths longer than 3m, the Contractor shall provide a line driver located at the source.

9. Twisted Pair Cabling for All Applications:

   a. The Contractor shall ensure that the twists in each cable pair are preserved to within 0.5 inch of the termination. The cable jacket shall be removed only to the extent required to make the termination.

   b. The Contractor shall ensure that the cable shields are continuous throughout, terminated, and grounded according to the manufacturer's recommendations.

E. Grounding Requirements:

1. Provide a minimum of #6 AWG conductor from the nearest electrical service ground bus or nearest telecommunications room ground bus bar to the A/V equipment racks and cabinets regardless of location. Size cable as required by the NEC.

2. Cables containing shields shall not have the shields grounded at conduits, boxes, racks, etc.

Ground the shield only at the equipment end.

3. Audio cable shields for line-level signals shall be connected to the metal equipment chassis at both ends of the cable.

4. Audio cables connected to transformers shall have the cable shield connected to the transformer shield and transformer case ground.

5. The Contractor shall not connect cable shields together from differing cables.

6. XLR cable shields shall be connected to chassis ground.

7. Signal-grounded balanced shields are not acceptable and shall not be installed. All balanced shields shall be chassis grounded.

F. Rack and Cabinet Requirements:

1. Ground equipment racks/cabinets as noted within this specification section and Section 27 05 26 - Communications Grounding.

2. Provide one (1) RU of space between adjacent pieces of equipment with top and/or bottom vents, above the topmost piece of equipment, and below the bottommost piece of equipment. Provide a vented cover panel covering each rack space.

3. Terminate all speaker cabling on individual barrier strips for positive "+", negative "-", and shield. The shield barrier strip shall be grounded.

4. Provide a power conditioning surge arrestor in the rack for distribution of AC power from the wall receptacles indicated on the plans. The quantity of plugs shall be adequate so

that no equipment in the rack shall require plugging into an AC source outside the rack.

5. Power sequencing shall be provided in the racks where shown on the drawings. All amplifiers located in the racks shall be sequenced "last on – first off". Power sequencers shall provide power conditioning and surge protection.

G. Audio System Installation Requirements:

1. The Contractor shall perform calculations for the optimal speaker tap settings to reach the desired SPL level and coverage without overloading the amplifier(s).

a. At a minimum, the following calculations shall be used:

1) Add together all speaker taps that will be on a single channel of the amplifier. Multiply that total by 1.2, which will allow for a 20% future expansion. Multiply that number by 1.25 to ensure the amplifier never exceeds 75% of its total output. Utilize the final number to determine the minimum amplifier power requirements.

2) For direct coupled systems (low impedance), allow a minimum of 10 dB headroom before any distortion occurs at the amplifier input indicator when beginning gain stage tests are set up. Increase headroom as appropriate for high

impact and clarity needs, typically exceeding 12 to 15 dB during continuous operation.

2. Connections of balanced to unbalanced equipment shall only be done through an active converter at the unbalanced side.

3. Connections of unbalanced to balanced equipment shall only be done through an active converter at the unbalanced side.

4. Connections from stereo balanced or unbalanced equipment to mono equipment of the same signal type shall only be done through a passive combiner.

5. Connections from mono balanced or unbalanced equipment to stereo equipment of the same signal type shall only be done through a passive divider.

6. The Contractor shall provide an isolation transformer for any balanced or unbalanced audio line that exhibits a hum, noise from EMI or RFI, power line noise, or ground loops.

7. The Contractor shall provide an active audio line driver for all balanced and unbalanced signals that exceed the distance limitations of the cabling.

H. Control System Installation Requirements:

1. The Contractor shall perform calculations for the required wire AWG size based on distance for system power for touch panels, keypads and other devices being powered. A minimum of a 15% overhead is required.

3.4 VIDEO SYSTEM TESTING AND CALIBRATION

A. All video equipment shall receive proper testing and configuration.

1. The Contractor shall submit the final calibration results to the Architect/Engineer for approval and include the approved results in final documentation submitted to the Owner.

2. Calibration by eye is not acceptable.

3. Any setting that cannot be calibrated because the projector or display lacks the functions shall be noted in the final documentation.

4. For video wall applications, or where multiple projectors or displays that will share content are being used within a single space, all displays after calibration shall be adjusted to match the lowest performing projector or display so all projectors or displays are uniform. If a projector or display differs greatly from the other displays, that projector or display shall be replaced at no cost to the Owner and recalibrated.

3.5 AUDIO SYSTEM TESTING AND CALIBRATION:

A. This Contractor shall field adjust any surface-mounted or flown loudspeaker orientation to achieve the necessary coverage pattern to the intended listening plane. Loudspeakers always face listeners and minimize coverage on walls. The contractor shall be familiar with the named and specified nominal coverage angle of all speakers above its crossover point or for speech range, (500-4,000 Hz).

B. All speakers shall be tested for polarity prior to high work and a table of test results shall be included for A/E inspection. All loudspeakers shall be connected with uniform polarity, where a positive pressure pulse at the input corresponds to a positive driver excursion, and all drivers are uniform always moving in the same direction. Main speakers shall not be lifted or hoisted into high access areas without polarity testing.

C. The Contractor shall make incremental adjustments on the equipment output and input tolerances to achieve matching signal levels while preserving +10 dB minimum headroom and also unity gain. Insert all broadband or high pass filters first for system protection after review of manufacturers specifications for power and bandpass.

D. The Contractor shall utilize a Real Time Audio (RTA) spectrum analyzer with AES2 Broadband pink noise at a minimum of 1/3 octave, capable of providing detailed plots and reports.

1. The Contractor shall have and own a calibrated Type 1 or Type 1.5 microphone for all measurements, that is recently calibrated within the last year.

2. Calibration by ear, tablets and portable phones with integrated microphones are never acceptable. All software analysis tools require a calibrated interface and calibrated microphone. No Android devices are used for metering or calibration. IOS devices with calibrated software and interfaces may be used.

E. Provide high quality media with full bandpass program material for critical listening. MP3 or streaming audio is not acceptable. Testing shall illustrate WAV file quality playback for impact and clarity.

F. The Contractor shall provide graphic plots of the reference ambient noise for each space at the time of the calibration and submit with the calibration results. Test signal shall be 10dB minimum above ambient noise levels during testing.

G. The Contractor shall use a listener sitting height of four (4) feet ± 1" for rooms where the primary function will be sitting. The Contractor shall use a listener standing height of five feet three inches (5.25') ± 1" for rooms where the primary function will be standing

3.6 AUDIO SYSTEM PERFORMANCE REQUIREMENTS

A. The Contractor shall test and provide documents verifying all the following performance criteria. The Architect/Engineer shall be informed when the testing will take place and have the option to witness the testing and ask for additional testing for any reason.

B. The Contractor shall develop an Audio Coverage Uniformity Measurement Location (ACUML) plan for each required space based on the project floor plans, and submit to the Architect/Engineer for review and approval prior to testing. The plan shall represent the majority of the listening area and perimeter seating in the direct field of main speakers.

C. The tests shall be performed at the multiple locations defined on the ACUML plan representing the majority of the listening area(s). The Contractor shall indicate on the floor plan drawings where each test was performed, with the corresponding graphic plot, and submit with the final documentation for review and approval by the Architect/Engineer.

D. The test shall be taken with AES2 Broadband pink noise at a minimum of 15 dB above the

reference ambient noise level, taking caution to not overdrive and clip any component of the system beyond 0.5% Total Harmonic Distortion (THD), with a maximum system THD of 1.0%.

E. The audio system(s) shall meet the following minimum requirements:

1. Achieve a total average SPL of 95 dBA in the majority of seating area with additional headroom. Use dBC for levels above 95 dBA.

2. The system's total SPL frequency response shall be within ± 4 dB from 500 Hz to 8000 Hz. All efforts shall be made to equalize the system's frequency response possible throughout the system's entire 100 Hz to 16kHz spectrum.

3. All vocal microphones shall have high and low pass filters set to minimize rumble, pop and hiss. The high pass filter cutoff frequency shall be set between 125 and 160 Hz, with a 12 dB per octave slope, minimum. The low pass filter cutoff frequency shall be set at 12,000 Hz, with a 6 dB per octave slope. Adjust frequency and slope as required to maximize performance for both male and female voices.

4. The subwoofer/speaker low/high crossover points shall be a Butterworth (BW) filter set at 80 Hz with a 24 dB per octave slope. This crossover point shall be adjusted as needed to achieve a smooth frequency response. The subwoofer high-pass filter shall be set to manufacturer's recommended half-power point or 40 Hz, whichever is higher.

5. Achieve a minimum RaSTI value of 0.63.

3.7 DSP-BASED AUDIO PROCESSOR PROGRAMMING

A. Full system programming shall be provided for the system. Programming shall be performed by a factory trained and certified programmer or an employee of the equipment manufacturer.

B. DSP pathfile with initial settings shall be provided by the Contractor for review by the Architect/Engineer before installation.

C. A parametric EQ shall be provided after each crossover point or as approved in the DSP pathfile during shop submittal review. These equalizers should not be made available to the user to adjust.

D. Levelers, compressor/limiters, duckers, gates and delays shall be preset during testing and commissioning and are not available for user adjustment following commissioning.

1. Adjust delays for time of flight plus 8 to 10 ms, typical.

E. Provide each microphone input with high-pass filter, 5-band parametric EQ, auto-leveler and volume module. Provide line level inputs with high-pass filter, 3-band parametric EQ, compressor/limiter, and volume module.

F. Acoustic Echo Cancelation (AEC) shall be provided for each conference microphone input.

G. A broadband pink noise generator shall be provided with a selectable on/off control button within the DSP pathfile. The noise shall be routable through all processing EQs and speaker outputs during testing.

H. Provide volume meters with labeling for each input and each output.

I. Provide with user control software to be installed on Owner-provided and installed computer.

J. The Contractor shall utilize the latest version of the programming software.

K. The Contractor shall ensure that all components are updated to the latest firmware at the completion of the project.

3.8 DSP-BASED AUDIO PROCESSOR CONTROL SOFTWARE PROGRAMMING

A. Full system software programming shall be provided for the system. Programming shall be performed by a factory-trained and certified programmer or an employee of the equipment manufacturer.

B. The Contractor shall schedule a series of meetings with the Owner and Architect/Engineer to define and determine the exact page layout requirements prior to the final configuration of the audio system. An Owner sign-off of the final layouts shall be required.

C. The Contractor shall use the latest version of the software.

D. At a minimum, there shall be password-protected pages for zone combining, input/output volume control with meters, speaker output volume control with meters, signal routing, signal processing (EQ's, feedback suppression, etc.), and supervision/maintenance for all spaces and combined zones.

E. A 15% programming dollar allowance shall be included for Owner and Architect/Engineer comments on additional system functionality as construction progresses. This shall be shown as a separate line item in the bid (include hours).

3.9 MULTIMEDIA CONTROL SYSTEM INTEGRATION AND PROGRAMMING

A. Programming and Integration for Control Systems:

1. Full system programming shall be provided for the system. Programming shall be performed by a factory trained and certified programmer or an employee of the equipment manufacturer.

2. The Contractor shall schedule a series of meetings with the Owner and Architect/Engineer to define and determine the exact integration requirements of the control system prior to the installation of the control system and components. An Owner sign-off of the final configuration shall be required.

3. This section only defines the minimum requirements. The programmer shall provide complete programming for a fully functional system.

4. The Contractor shall utilize the latest version of the programming software.

5. The Contractor shall ensure that all components are updated to the latest firmware at the completion of the project.

6. The IP-based control system and controlled components shall be on a dedicated Virtual LAN (VLAN) for the A/V systems. These components shall be on a dedicated subnetwork of the VLAN. The Contractor shall coordinate these requirements with the Owner prior to

installation.

7. Integration and programming of the following pieces of equipment shall be provided, with the following minimum features and functions:

   a. All equipment shall include on/off control, except for equipment that must remain active for system functionality.

   b. Integration of HDCP (High-bandwidth Digital Content Protection) and DPCP (Display Port Content Protection) protected content and sources:

      1) No protected sources or content shall be allowed to be selected to route through non-protected devices and displays. A warning shall be displayed stating this information to the user.

   c. DSP Audio Processor Integration:

      1) The Contractor shall provide bi-directional RS-232 or Ethernet control system connections and programming with the following minimum functions:

         a) On/off control of all microphones.

         b) Volume and mute control of all microphones and input sources.

         c) Volume and mute control of all outputs.

         d) Independent volume and mute control of all assisted listening outputs.

         e) On/off and reset control of feedback eliminators and suppressors.

         f) Advanced routing of audio signals.

         g) Audio conferencing dialer keypad with speed dials.

         h) Audio conferencing CallerID display on touchpanel and/or workstation.

         i) Acoustic Echo Cancelation (AEC) control.

   d. Audio Conference Integration:

      1) Refer to DSP Audio Processor Integration for requirements.

   e. Display Integration:

      1) The displays shall be integrated into the A/V control system via

         bi-directional RS-232 or Ethernet control. Provide with the following minimum functions:

         a) On/off control.

         b) Display status feedback.

c) Source switching control.

d) Audio volume control with mute.

e) Video mute.

f) Tuner channel control with direct channel access.

g) Station presets with station icons.

f. Video Conference/Telepresence Integration:

1) The Contractor shall provide bi-directional RS-232 or Ethernet control system connections and programming with the following minimum functions:

a) Refer to DSP Audio Processor Integration for audio requirements.

b) Video conferencing dialer keypad with speed dials.

c) PTZ near end camera control.

d) PTZ far end camera control with lockout control at the far end.

e) Multi-window control with multiple presets the contractor shall coordinate with the Owner and users on designed layouts. All system inputs shall be selectable for each window.

g. Pan/Tilt/Zoom (PTZ) Camera Integration:

1) The Contractor shall provide bi-directional RS-232 or Ethernet control system connections and programming with the following minimum functions:

a) Provide full pan, tilt and zoom control.

b) Provide presets for fixed camera positions, contractor shall coordinate with the Owner for desired preset positions.

h. Digital Video Recorder (DVR) Integration:

1) The Contractor shall provide bi-directional RS-232 or Ethernet control system connections and programming with the following minimum functions:

a) Camera selection buttons to view individual cameras.

b) Pan/Tilt/Zoom (PTZ) control for applicable cameras.

c) Record start, stop and playback control.

d) All other required control for normal DVR functions and operations.

e) This defines only the basic integration requirements.

B. Programming and Configuration for Touch Panels:

1. This section only defines the minimum requirements. The programmer shall provide complete touch panel layouts and programming for a fully functional system.

2. The Contractor shall schedule a series of meetings with the Owner and Architect/Engineer to define and determine the exact touch panel layout requirements prior to the purchase and installation of the touch panels. An Owner sign-off of the final layouts shall be required.

    a. Some tabs, pages, buttons and functions may be required to have a password at the Owner's discretion. This shall be coordinated during the meetings.

3. Contractor logos are not allowed on the touch panels. The Contractor shall coordinate with the Owner on desired logos to be displayed.

4. All programming for interface and control of all devices shown on the drawings shall be provided. Programming shall be provided for the following minimum functionality:

    a. The main screen shall include graphical buttons for the primary room functions.

        1) Upon selection of the graphical button, all the required functions shall be displayed on the screen. All required equipment shall turn on.

    b. Master System On/Off Control:

        1) When the master system off button is selected, all capable components within the system shall be turned off or placed on standby, except for equipment that is required to remain on for the system to function like the control system processor.

    c. The main screen shall include graphical buttons for the selection of individual source selections.

        1) Upon selection of the graphical button for a source selection, all functional controls for the pieces of equipment, as well as all status indicators, shall be provided in graphical format on the screen.

        2) Rooms with multiple independent outputs and displays shall have a source routing matrix to allow any input to be routed to any output.

    d. The main screen shall include a button for advanced equipment status and monitoring.

        1) Upon selection of the graphical button, the page shall display the on/off status of all monitored equipment, projector lamp hours, projector filter status, and all other features listed within this section that require monitoring

    e. The main screen shall include a button for microphone volume control and muting.

        1) Upon selection of the graphical button, it shall display the individual volume level of each wired and wireless microphone, with a mute for each.

        2) Rooms with multiple independent audio outputs and zones shall have a source

routing matrix to allow any input to be routed to any output or zone.

f. At all times, on all screens, a button shall be provided to return to the main screen, except for modal pop-ups.

g. A master volume control and mute shall be provided at all times on all screens, except for modal pop-ups.

h. A master video mute shall be provided at all times on all screens, except for modal pop-ups and audio-only functions.

i. All unused hard buttons shall not be labeled. A blank touch panel bezel shall be provided if no hard buttons are used.

3.10 SYSTEM COMMISSIONING

A. The Contractor shall notify the Architect/Engineer and Owner prior to conducting final system commissioning.

B. Contractors' tests shall be scheduled and documented in accordance with the commissioning requirements. Refer to Section 01 09 00 - General Commissioning for additional information.

C. System verification testing is part of the commissioning process. Verification testing shall be performed by the Contractor and witnessed and documented by the Commissioning Agent. Refer to Section 01 09 00 - General Commissioning for system verification tests and commissioning requirements.

D. Contractor shall demonstrate system performance of all equipment and adjust settings as directed by the Architect/Engineer and/or Owner.

1. All system settings, software options and other parameters shall be simulated and tested by the Contractor

3.11 FIELD QUALITY CONTROL

A. Where these specifications require a product or assembly without the use of a brand or trade name, provide a product that meets the requirements of the specifications, as supplied and warranted by the system vendor. If the product or assembly is not available from the system vendor, provide product or assembly as recommended by the system vendor.

B. Periodic observations will be performed during construction to verify compliance with the requirements of the specifications. These services do not relieve the Contractor of responsibility for compliance with the Contract Documents.

3.12 FIELD SERVICES

A. The installer shall conduct a planning meeting with the Owner. The purpose of this meeting shall be to determine all equipment settings that are considered preferences (where proper system operation does not depend on the setting).

B. The installer shall include labor for all planning and all programming activities required to implement the Owner's preferences for equipment settings.

C. It shall be the responsibility of the Contractor/installer to provide a complete, functional system as described by the design documents. These responsibilities include:

1. Complete hardware setup, installation and wiring and software configuration.

2. Complete programming of software in accordance with the Owner's desires determined by the planning meeting.

3. Complete system diagnostic verification.

4. Complete system commissioning.

3.13 SYSTEM ACCEPTANCE

A. The Contractor shall submit for review a formal acceptance and system checkout procedure. The system checkout procedures shall include all system components and software. The Contractor shall perform the tests and settings and document all results.

3.14 SYSTEM DOCUMENTATION

A. Complete documentation shall be provided for the system. The documentation shall describe:

1. All operational parameters of the system.

2. Complete documentation of programming and features.

3. Complete operating instructions for all hardware and software.

B. The following sections shall be provided in the system documentation:

1. User Manual: A step-by-step guide and instructions detailing all system user functions.

2. Technical Manual: A comprehensive document providing all system operations, troubleshooting flowcharts, functional system layout, wiring diagrams, block diagrams and schematic diagrams.

3. Maintenance Manual: A comprehensive document on all aspects of physical maintenance of the systems, including cleaning of the displays, bulb changes, filter cleaning, filter changing and UPS maintenance.

3.15 SYSTEM TRAINING

A. All labor and materials required for on-site system training shall be provided. Training shall be conducted at the project site using the project equipment.

1. Provide two week's advanced notice of training to the Owner and Architect/Engineer.

2. The Architect/Engineer shall be presented with the option to attend the training.

3. Provide a training outline agenda describing the subject matter and the recommended audience for each topic.

B. At a minimum, the following training shall be conducted:

1. User Manual: A course detailing the system functions and operations that a daily user will encounter.

2. Technical User: Provide configuration training on all aspects of the system(s), including equipment and software.

3. Maintenance User: Provide training on all aspects of physical maintenance of the systems, including cleaning of the displays, bulb changes, filter cleaning and filter changing.

C. Minimum on-site training times shall be:

1. User Manual: One (1) day.

2. Technical user: One (1) day.

3. Maintenance user: Four (4) hours.

4. The Contractor shall include in the bid one (1) additional day of training each quarter for the 12-month period of the project warranty. The Contractor shall return to the site for additional follow-up training during this period.

END OF SECTION

APPENDIX B

EMERGENCY OPERATIONS CENTER IMPROVEMENTS PROJECT
PROJECT NO.: PW 26-05

PLANS

CAUTION: IF THIS PRINT IS NOT 30"X42" THEN IT IS A REDUCED PRINT

PROJECT

CITY OF EL SEGUNDO
EMERGENCY OPERATION CENTER RENOVATION
348 MAIN STREET
EL SEGUNDO, CA 90245

ABBREVIATIONS

(E)	EXISTING	IN.	INCH OR INCHES
(N)	NEW	INSUL.	INSULATION
L	ANGLE	INT.	INTERIOR
&	AND	JAN.	JANITOR
@	AT	JT.	JOINT
#	POUND OR NUMBER	KIT.	KITCHEN
CL	CENTERLINE	LAB.	LABORATORY
DIA	DIAMETER OR ROUND	LAM.	LAMINATE
ACOUS.	ACOUSTICAL	LAV.	LAVATORY
ACT	ACOUSTICAL CEILING TILE	LKR.	LOCKER
A.D.	AREA DRAIN	LT.	LIGHT
ARCH.	ARCHITECTURAL	MAX.	MAXIMUM
AES.ST.	AESTHETIC STEEL	M.C.	MEDICINE CABINET
AGG.	AGGREGATE	MECH.	MECHANICAL
ALUM.	ALUMINUM	MEMB.	MEMBRANE
ANO.	ANODIZED	MET.	METAL
APPROX.	APPROXIMATE	MFR.	MANUFACTURER
ARCH.	ARCHITECTURAL	MH.	MANHOLE
ASPH.	ASPHALT	MIN.	MINIMUM OR MINUTES
BD.	BOARD	MIR.	MIRROR
BITUM.	BITUMINOUS	MISC.	MISCELLANEOUS
BLDG.	BUILDING	M.O.	MASONRY OPENING
BLK.	BLOCK	MTD	MOUNTED
BLKG.	BLOCKING	MTL	MATERIAL
BM.	BEAM	MUL.	MULLION
BOT.	BOTTOM	N	NEW
CAB.	CABINET	N.I.C.	NOT IN CONTRACT
C.B.	CATCH BASIN	NO.	NUMBER
CEM.	CEMENT	NOM.	NOMINAL
CER.	CERAMIC	N.R.	NOT RATED
C.G.	CORNER GUARD	N.T.S.	NOT TO SCALE
C.I.	CAST IRON	O.A.	OVERALL
CLG.	CEILING	OBS.	OBSCURE
CLKG.	CAULKING	O.C.	ON CENTER
CLO.	CLOSET	O.D.	OUTSIDE DIAMETER
CLR.	CLEAR	OFF.	OFFICE
CNTR.	CENTER	OPNG.	OPENING
C.O.	CASED OPENING	OPP.	OPPOSITE
COL.	COLUMN	O.L.F.	OCCUPANT LOAD FACTOR
CONC.	CONCRETE	P.F.	PRE-FINISHED
CONN.	CONNECTION	P.LAM.	PLASTIC LAMINATE
CONSTR.	CONSTRUCTION	P.T.D.	PAPER TOWEL DISPENSER
CONT.	CONTINUOUS		COMBINATION
CORR.	CORRIDOR	P.T.D./R	PAPER TOWEL DISPENSER & RECEPTACLE
CTSK.	COUNTERSUNK		
CTR.	COUNTER	PL.	PLATE
DBL.	DOUBLE	PLAS.	PLASTER
DEPT.	DEPARTMENT	PLYWD.	PLYWOOD
DET.	DETAIL	PR.	PAIR
D.F.	DRINKING FOUNTAIN	PRCST.	PRE-CAST
DIA.	DIAMETER	PT.	POINT OR PAINTED
DIM.	DIMENSION	Q.T.	QUARRY TILE
DISP.	DISPENSER	R.	RISER
DN.	DOWN	RAD.	RADIUS
D.O.	DOOR OPENING	R.D.	ROOF DRAIN
DR.	DOOR	REF.	REFERENCE
D.S.	DOWNSPOUT	REFR.	REFRIGERATOR
D.S.P.	DRY STANDPIPE	REGTR.	REGISTER
DWG.	DRAWING	REINF.	REINFORCED
DWR.	DRAWER	REQ.	REQUIRED
E	EXISTING	RESIL.	RESILIENT
EA.	EACH	RM.	ROOM
E.D.F.	ELECTRICAL DRINKING FOUNTAIN	R.O.	ROUGH OPENING
E.J.	EXPANSION JOINT	RWD.	REDWOOD
EL.	ELEVATION	R.W.L.	RAIN WATER LEADER
ELEC.	ELECTRICAL	S.C.	SOLID CORE
ELEV.	ELEVATOR	S.C.D.	SEAT COVER DISPENSER
EMER.	EMERGENCY	SCHED.	SCHEDULE
ENCL.	ENCLOSURE	S.A.	SOAP DISPENSER
E.P.	ELECTRICAL PANEL BOARD	SECT.	SECTION
EQ.	EQUAL	SH.	SHELF
EQPT.	EQUIPMENT	SHR.	SHOWER
E.W.C.	ELECTRICAL WATER COOLER	SHT.	SHEET
EXST.	EXISTING	SIM.	SIMILAR
EXP.	EXPANSION	S.N.D.	SANITARY NAPKIN DISPENSER
EXPO.	EXPOSED	S.N.R.	SANITARY NAPKIN RECEPTACLE
EXT.	EXTERIOR	SPEC.	SPECIFICATION
F.A.	FIRE ALARM	SQ.	SQUARE
F.B.	FLAT BAR	S.ST.	STAINLESS STEEL
F.D.	FLOOR DRAIN	S.SK.	SERVICE SINK
FDN.	FOUNDATION	ST.	STAINED
F.A.	FIRE EXTINGUISHER	STA.	STATION
F.A.C.	FIRE EXTINGUISHER CABINET	STD.	STANDARD
F.B.	FINISH FLOOR	STL.	STEEL
F.H.C.	FIRE HOSE CABINET	STOR.	STORAGE
FIN.	FINISH	STRL.	STRUCTURAL
FL.	FLOOR	SUSP.	SUSPENDED
FLASH.	FLASHING	SYM.	SYMMETRICAL
FLUOR.	FLUORESCENT	T.	TEMPERED
F.O.C.	FACE OF CONCRETE	TRD.	THREAD
F.O.F.	FACE OF MASONRY	T.B.	TOWEL BAR
F.O.S.	FACE OF STUD	T.C.	TOP OF CURB
FPRF.	FIREPROOF	TEL.	TELEPHONE
F.R.	FIRE-RATED	TER.	TERRAZZO
F.S.	FULL SIZE	T.&G.	TONGUE AND GROOVE
FT.	FOOT OR FEET	THK.	THICK
FTG.	FOOTING	T.O.C.	TOP OF CANOPY
FURR.	FURRING	T.O.M.S.	TOP OF MECHANICAL SCREEN
FUT.	FUTURE	T.O.P.	TOP OF PARAPET
GA.	GAUGE	T.O.S.	TOP OF SURFACE
GALV.	GALVANIZED	T.O.W.	TOP OF SURFACE
G.B.	GRAB BAR	T.P.	TOP OF PAVEMENT
G.I.S.M	GALVANIZED IRON SHEET METAL	T.P.D.	TOILET PAPER DISPENSER
GL.	GLASS	T.V.	TELEVISION
GND.	GROUND	TYP.	TYPICAL
GR.	GRADE	U.N.O.	UNLESS NOTED OTHERWISE
GYP.	GYPSUM	V.P.	VISION PANEL
H.B.	HOSE BIB	VERT.	VERTICAL
H.C.	HOLLOW CORE	VEST.	VESTIBULE
HDWD.	HARDWOOD	W/	WITH
HDWE.	HARDWARE	W.C.	WATER CLOSET
H.M.	HOLLOW METAL	WD.	WOOD
HORIZ.	HORIZONTAL	W/O	WITHOUT
HR.	HOUR	W.P.	WATERPROOF
H.	HEIGHT	WT.	WEIGHT
I.D.	INSIDE DIAMETER		

PROJECT TEAM

OWNER

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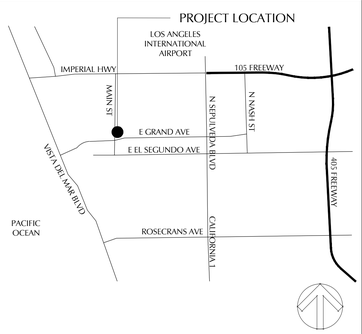
VICINITY MAP



SCOPE OF WORK

RENOVATION OF AN EXISTING EOC (EMERGENCY OPERATION CENTER) WITHIN THE EL SEGUNDO POLICE DEPT BUILDING. NEW FINISHES, LIGHTING AND UPGRADES TO THE EXISTING AV AND TELE COMMUNICATIONS OPERATIONS SYSTEM.

NEW AV EQUIPMENT SERVING THE EOC IS TO BE HOUSED IN THE EXISTING COMMUNICATION EQUIPMENT ROOM 108. NO MECHANICAL UPGRADES REQUIRED OR INCLUDED WITH THIS CONSTRUCTION.

BUILDING INFORMATION

USE OF BUILDING:	COMMERCIAL - EXISTING, NO CHANGE
TYPE OF CONSTRUCTION:	TYPE III-B - EXISTING, NO CHANGE
NUMBER OF STORIES:	2 STORY - EXISTING, NO CHANGE
TOTAL BUILDING SQUARE FOOTAGE:	± 35,059 SF - EXISTING, NO CHANGE
FULLY FIRE SPRINKLERED:	YES- EXISTING CONDITION, NO CHANGE
FIRE ALARM SYSTEM:	AUTOMATIC FIRE ALARM - EXISTING SYSTEM
OCCUPANCY GROUP:	B / A-3 /S-3 - EXISTING, NO CHANGE
EOC T.I. SQUARE FOOTAGE:	± 1,189 SF (EXISTING)

NOTE: SELECTIVE ABATEMENT REQUIRED. REFER TO ASBESTOS & LEAD REPORT # CI26001 DATED FEB 3, 2026

CODE COMPLIANCE

THE CONTRACTOR SHALL CONFORM TO ALL CODES, ORDINANCES, ETC. WHICH HAVE JURISDICTION OVER THE WORK. THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR COMPLIANCE WITH LATEST REVISIONS OF ALL OTHER APPLICABLE CODES AND ORDINANCES INCLUDING THE FOLLOWING:

CALIFORNIA CODE OF REGULATIONS:
TITLE 19 - PUBLIC SAFETY

TITLE 24 - BUILDING STANDARDS CODE:
2025 CALIFORNIA ADMINISTRATIVE CODE
2025 CALIFORNIA ENERGY CODE - TITLE 24
2025 CALIFORNIA BUILDING CODE (CBC)
2025 CALIFORNIA ELECTRICAL CODE (CEC)
2025 CALIFORNIA MECHANICAL CODE (CMC)
2025 CALIFORNIA PLUMBING CODE (CPC)
2025 CALIFORNIA FIRE CODE (CFC)

CITY OF EL SEGUNDO MUNICIPAL CODE

CITY APPROVALS

DRAWING INDEX

ARCHITECTURAL

SHEET	DESCRIPTION
A-0.0	COVER SHEET
A-0.1	GENERAL NOTES
A-0.2	BUILDING & SAFETY
A-0.3	BUILDING & SAFETY
A-0.4	CALGREEN
A-0.5	CALGREEN
A-0.6	CALGREEN
A-0.7	CALGREEN
A-0.8	SITE PLAN (FOR REFERENCE ONLY)
A-0.9	EGRESS PLANS
A-1.0	DEMOLITION PLANS
A-2.0	CONSTRUCTION, POWER AND CEILING PLANS
A-3.0	FINISH PLANS, FURNITURE AND INTERIOR ELEVATIONS

ELECTRICAL DRAWINGS

SHEET	DESCRIPTION
E-000	ELECTRICAL GENERAL NOTES & SHEET INDEX
E-001	ELECTRICAL SYMBOL LIST & ABBREVIATIONS
E-002	ELECTRICAL SINGLE LINE DIAGRAM
E-003	ELECTRICAL PANEL SCHEDULE
E-100	POWER DEMOLITION FLOOR PLAN
E-101	DEMOLITION LIGHTING PLAN
E-200	REMODEL POWER FLOOR PLAN
E-201	REMODEL LIGHTING PLAN
E-202	EGRESS LIGHTING PHOTOMETRICS PLAN
E-300	TITLE 24 LIGHTING COMPLIANCE
E-400	ELECTRICAL DETAILS

PLUMBING DRAWINGS

SHEET	DESCRIPTION
P-000	PLUMBING GENERAL NOTES & SHEET INDEX
P-200	PLUMBING DEMOLITION FLOOR PLAN
P-201	PLUMBING REMODEL FLOOR PLAN

TECHNOLOGY DRAWINGS

SHEET	DESCRIPTION
T-001	TECHNOLOGY SYMBOLS LIST
T-002	TECHNOLOGY RISER DIAGRAM
T-003	TECHNOLOGY RISER DIAGRAM AV SCHEMATIC DIAGRAM
T-100	TECHNOLOGY DEMOLITION PLAN
T-200	TECHNOLOGY REMODEL PLAN
T-300	TECHNOLOGY DETAILS

KARDENT
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ARCHITECT:

LICENSED ARCHITECT
LOBARDO FAUSTINO
C-35088
March 31, 2027
RENEWAL
STATE OF CALIFORNIA

DATE SIGNED: 05/21/26

CONSULTANT:

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REVISIONS:

NO.:	DATE:	DESCRIPTION:
	05/01/26	PLAN CHECK
	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS CENTER (EOC)
348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY: -
CHECKED BY: MQ

SHEET TITLE: COVER SHEET

SHEET NUMBER: A-0.0

PROJECT: 10389.17
SCALE: AS NOTED
DATE: FEB 2026

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PLAN CHECK NUMBER 348 MAIN ST, EL SEGUNDO, CA 90245

P:\KARDENT DESIGN\PROJECTS\10389.17 CITY OF EL SEGUNDO - EOC_EMERGENCY OPERATIONS CENTER\DRAWING FILES\SL_CONDOCS\10389.17_A-0.0 COVER SHEET.DWG

CAUTION: IF THIS PRINT IS NOT 30"X42" THEN IT IS A REDUCED PRINT

ELECTRICAL ACCESSIBILITY NOTES

ELECTRICAL CONTROLS & SWITCHES INTENDED TO BE USED BY THE OCCUPANT OF A ROOM OR AREA TO CONTROL LIGHTING AND RECEPTACLE OUTLETS, APPLICANTS OR COOLING, HEATING AND VENTILATING EQUIPMENT SHALL BE LOCATED WITHIN ALLOWABLE REACH RANGES. LOW REACH SHALL BE MEASURED TO THE BOTTOM OF THE OUTLET BOX AND HIGH REACH SHALL BE MEASURED TO THE TOP OF THE OUTLET BOX. (CBC 11B-308.1.1)

ELECTRICAL RECEPTACLE OUTLETS ON BRANCH CIRCUITS OF 30 AMPERES OR LESS AND COMMUNICATION SYSTEM RECEPTACLES SHALL BE LOCATED WITHIN ALLOWABLE REACH RANGES. LOW REACH SHALL BE MEASURED TO THE BOTTOM OF THE OUTLET BOX AND HIGH REACH SHALL BE MEASURED TO THE TOP OF THE OUTLET BOX. (CBC 11B-308.1.2)

HIGH FORWARD REACH THAT IS UNOBSTRUCTED SHALL BE 48 INCHES MAX. & THE LOW FORWARD REACH SHALL BE 15 INCHES MIN. ABOVE THE FINISH FLOOR. (CBC 11B-308.2.1)

HIGH FORWARD REACH SHALL BE 48" MAXIMUM WHERE THE REACH DEPTH IS 20 INCHES OR LESS AND 44 INCHES MAXIMUM WHERE THE REACH DEPTH EXCEEDS 20 INCHES. HIGH FORWARD REACH SHALL NOT EXCEED 25 INCHES IN DEPTH. (CBC 11B-308.2.2)

WHERE A HIGH FORWARD REACH IS OVER AN OBSTRUCTION, THE CLEAR FLOOR SPACE SHALL EXTEND BENEATH THE ELEMENT FOR A DISTANCE NOT LESS THAN THE REQUIRED REACH DEPTH OVER THE OBSTRUCTION (CBC 11B-308.2.2.)

HIGH SIDE REACH SHALL BE 48 INCHES MAXIMUM AND THE LOW SIDE REACH SHALL BE 15 INCHES MINIMUM ABOVE THE FINISH FLOOR WHERE THE SIDE REACH IS UNOBSTRUCTED OR THE REACH DEPTH OF ANY OBSTRUCTION DOES NOT EXCEED 10 INCHES. (CBC 11B-308.3.1)

HIGH SIDE REACH SHALL BE 46 INCHES MAXIMUM ABOVE THE FINISH FLOOR WHERE THE HIGH SIDE REACH IS OVER AN OBSTRUCTION MORE THAN 10 INCHES BUT NOTE MORE THAN 24 INCHES IN DEPTH. OBSTRUCTIONS FOR HIGH SIDE REACH SHALL NOT EXCEED 34 INCHES IN HEIGHT AND 24 INCHES IN DEPTH. (CBC 11B-308.2)

OPERABLE PARTS ON ACCESSIBLE ELEMENTS, ACCESSIBLE ROUTES AND IN ACCESSIBLE ROOMS & SPACES SHALL BE PROVIDED SHALL BE FLOOR OR GROUND SPACE COMPLYING WITH CBC 11B-CLEAR FLOOR OR GROUND SPACE AND BE PLACED WITHIN ONE OR MORE OF THE OPERABLE REACH RANGES SPECIFIED IN CBC 11B-308 REACH RANGES.

OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS MAX.

G.C. HVAC NOTES

1. NOTIFY THE MECHANICAL ENGINEER FOR REVIEW OF MECHANICAL WORK PRIOR TO INSPECTION AND CLOSING-UP CEILING
2. HVAC SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD SUPERVISION OF ALL THEIR WORK DURING INSTALLATION AND SHALL INSPECT ALL SYSTEMS FOR PROPER OPERATIONS AT COMPLETION OF JOB
3. SUBMIT SHOP DRAWINGS OF ALL HVAC EQUIPMENT, REGISTERS, INCLUDING ACCESS PANELS IF REQUIRED TO KARDENT FOR REVIEW AND APPROVAL PRIOR TO PROCEEDING WITH FABRICATION AND/OR INSTALLATION OR RELOCATION
4. COORDINATE INSTALLATION WITH ALL TRADES AS REQUIRED FOR PROPER ASSEMBLY. CEILING DIFFUSERS TO BE RELOCATED TO ACCOMODATE NEW LIGHT FIXTURE PATTERNS INDICATED ON THE DRAWINGS. NOTIFY KARDENT IMMEDIATELY OF ANY DISCREPANCIES FROM FIELD CONDITIONS
5. THE MECHANICAL ENGINEER SHALL COORDINATE NECESSARY ENGINEERING DRAWINGS AND CALCULATIONS TO REWORK ALL EXISTING EQUIPMENT AND TO DETERMINE ALL NEW EQUIPMENT TO MEET THE CLIENT'S REQUIREMENT
6. VERIFY HVAC CONDITIONS/CONSTRUCTION WITH BUILDING ENGINEER TO ENSURE ADEQUACY OF EXISTING UNITS. ANY ADDITIONS TO HVAC TO BE INCLUDED IN SCOPE AND BID. G.C. TO VERIFY CAPACITY OF EXISTING ELECTRICAL PANEL/ TRANSFORMER IS ADEQUATE
7. PROTECT EXISTING T-STAT (WHERE OCCURS) DURING DEMOLITION UNO

G.C. ENERGY NOTES

1. GENERAL: CONSTRUCTION SHALL COMPLY WITH THE AIR LEAKAGE REQUIREMENTS OF THE CALIFORNIA ENERGY CODE 140.3 FOR WINDOWS, DOORS, CAULKING AND SEALING
2. WINDOWS: (UNDER SHELL BUILDING WORK) FIXED WINDOWS CONSTRUCTED AND/OR ERECTED ON SITE SHALL BE SEALED TO LIMIT AIR INFILTRATION IN ACCORDANCE WITH LOCAL CODE AND MANUFACTURER SPECIFICATIONS
3. DOORS: (UNDER SHELL BUILDING WORK) ALL EXTERIOR DOORS SHALL BE SO DESIGNED TO LIMIT AIR LEAKAGE AROUND THE PERIMETER WHEN IN A CLOSED POSITION
   a. ALL DOORS SHALL BE PROVIDED WITH A SEAL, ASTRAGAL OR BAFFLE AT THE HEAD AND SILL
   b. DOORS REQUIRING VERTICAL TRACK OR GLIDES SHALL USE A CONTINUOUS MOUNTING ANGLE AND SEALED IN ACCORDANCE WITH SECTION T120-1495 (E) AT EACH END
   c. DOORS MOUNTED BETWEEN THE JAMBS SHALL HAVE A CONTINUOUS SEAL OR BAFFLE AT EACH JAMB
   d. DOUBLE DOORS SHALL BE PROVIDED WITH A WEATHER-TIGHT ASTRAGAL OR CLOSURE AT THE CENTER JAMB.MANUFACTURED DOORS SHALL HAVE AIR INFILTRATION RATES CERTIFIED BY THE MANUFACTURER AS NOT EXCEEDING .50 CFM/SQ.FT. OF DOOR AREA FOR SINGLE DOORS, AND 1.00 CFM/SQ.FT. OF DOOR AREA FOR DOUBLE DOORS
4. CAULKING AND SEALING: OPEN EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES, BETWEEN WALL AND FOUNDATION, BETWEEN WALL AND ROOF, BETWEEN WALL PANELS, AT PENETRATIONS OF UTILITY SERVICES THROUGH WALLS, FLOORS AND ROOFS AND ALL OTHER OPENINGS IN THE EXTERIOR ENVELOPE SHALL BE SEALED, CAULKED OR WEATHER-STRIPPED TO LIMIT AIR LEAKAGE
5. SITE-CONSTRUCTED DOORS AND WINDOWS, EXTERIOR JOINTS, AND OPENINGS IN THE BUILDING ENVELOPE THAT ARE OBSERVABLE SOURCES OF AIR LEAKAGE SHALL BE CAULKED, GASKETED, WEATHER-STRIPPED OR OTHERWISE SEALED

G.C. FLOOR COVERING NOTES

1. SUBMIT THREE (3) FULL SIZE SAMPLES AND A DIMENSIONED SEAMING DIAGRAM TO KARDENT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION OF SPECIFIED FLOOR COVERING AND BASIC MATERIALS
2. FLOORING SUBCONTRACTOR TO REVIEW PERTINENT FLOOR PATCHING NOTES IN SECTION 3.01, PATCHING & CUTTING ON THIS SHEET, AND ENSURE SURFACES ARE PROPERLY PREPPED PRIOR TO INSTALLING NEW MATERIALS AND/OR FINISHES
3. FLOOR PREPARATION IS THE RESPONSIBILITY OF THE FLOOR SUBCONTRACTOR. CONTRACTOR SHALL FILL, SAND, AND LEVEL AS REQUIRED PRIOR TO INSTALLATION FINISH MATERIAL. ALL SELF LEVELING COMPOUNDS USED SHALL BE CEMENTITIOUS. ALL IMPERFECTIONS AND SLIGHT DEPRESSIONS IN THE FLOOR SURFACE SHALL BE SKIM COATED
4. ALL NEW FLOORING IS TO BE PROVIDED AND INSTALLED BY GENERAL CONTRACTOR AND SHALL BE AS SPECIFIED ON THE DRAWINGS, UNO
5. FLOORING TILES SHALL BE LAID IN SQUARE PATTERN WITH COURSES, PARALLEL TO WALLS, UNO.
6. TILES SHALL BE SECURELY CEMENTED AND SHALL BE LAID WITH TIGHT JOINTS. THE ADHESIVE USED FOR CEMENTING TILE SHALL BE APPLIED FAR ENOUGH IN ADVANCE OF THE SETTING TO PERMIT THE ADHESIVE TO REACH ITS INITIAL SET, BUT NOT ITS FINAL SET. ALL SHEET TILE FLOORING SHALL BE INSTALLED OVER BACKED ISOLATION WATERPROOFING MEMBRANE. CONTRACTOR TO TEST SLAB FOR MOISTURE PRIOR TO INSTALLATION OF RESILIENT FLOORING, AND INSTALL PER MANUFACTURER'S INSTRUCTIONS
7. CLEAN, REMOVE ALL SPOTS OF ADHESIVE AND SURFACES STAINS AND SCRAPS; CARTONS AND CONTAINERS SHALL BE REMOVED FROM THE BUILDING UPON COMPLETION OF WORK
8. PROVIDE AND MAINTAIN ADEQUATE PROTECTION FOR ALL FLOORING WORK FOR THE DURATION OF THE CONTRACT AND REMOVE ALL PROTECTION PRIOR TO PUNCHLIST. ONLY CLIENT APPROVED CARPET PROTECTION SHALL BE USED, ENSURING NO RESIDUE SHALL DAMAGE FLOOR
9. COORDINATE ALL FLOORING SUBCONTRACTORS INVOLVED TO ENSURE FLUSH INSTALLATION OF VARYING FLOOR MATERIALS SPECIFIED ON THE DRAWINGS. ALL TRANSITION STRIPS TO BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION
10. ALL FLOOR SURFACES TO BE PREPPED PER MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS
11. PROVIDE READY-ON STRIP OR METAL TRANSITION STRIP WHERE MATERIAL TRANSITIONS OCCUR. PROVIDE SAMPLE SUBMITTAL TO KARDENT FOR REVIEW
12. WALL BASE SHALL BE ROLLED GOODS UNO. NO WALL BASE TO BE 4 FOOT LENGTHS UNLESS PRIOR APPROVAL IS RECEIVED FROM CLIENT
13. NO TRANSITIONS BETWEEN FLOOR SURFACES TO BE GREATER THAN ½"
14. INTERIOR FLOOR FINISH AND FLOOR COVERING MATERIALS SHALL COMPLY WITH CBC 804.2 THROUGH CBC 804.4.2

G.C. CEILING NOTES

1. PROVIDE AND INSTALL NEW CEILING SYSTEM IN DESIGNATED AREAS AS SHOWN ON THE REFLECTED CEILING PLAN
2. REVIEW ALL CEILING HEIGHTS AND CEILING PLENUM CONDITIONS WITH SUBCONTRACTORS FOR CLEARANCE OF DUCTWORK, LIGHTING AND OTHER OBSTRUCTIONS TO ASSURE THE FINISHED CEILING HEIGHT SHOWN ON DRAWINGS IS ACHIEVABLE AND CONTINUOUS. ANY DISCREPANCIES SHALL BE BROUGHT TO ARCHITECT'S ATTENTION PRIOR TO FINAL PRICING.
3. CEILING HEIGHTS SHALL BE AS SHOWN ON DRAWINGS AND DETAILS. ANY DEVIATION FROM HEIGHTS SHOWN BASED UPON EXISTING FIELD CONDITIONS SHALL BE SUBMITTED TO ARCHITECT FOR REVIEW PRIOR TO START OF WORK IN QUESTION, OR RELATED WORK
4. CLOSELY COORDINATE CEILING SUBCONTRACTOR'S WORK WITH OTHER SUBCONTRACTORS AND CLIENT VENDORS WHEREVER THEIR RESPECTIVE WORK IS CONTIGUOUS
5. PROVIDE AND INSTALL ALL CEILING ACCESS PANELS IN GYPSUM BOARD CEILINGS AS REQUIRED FOR MECHANICAL, ELECTRICAL AND PLUMBING ACCESS PER LOCAL CODES, WHETHER INDICATED ON DRAWINGS OR NOT. COORDINATE LOCATIONS SIZE AND TYPE WITH KARDENT PRIOR TO INSTALLATION
6. PRIOR TO CLOSING UP ANY CEILING, ALL PLENUM SYSTEMS (HVAC, PLUMBING, ELECTRICAL, ETC.) SHALL BE INSPECTED AND WHERE REQUIRED, TESTED BY CONTRACTOR'S ENGINEERS, TO ENSURE THEIR PROPER INSTALLATION AND FUNCTION
7. CEILINGS IN CLOSETS SHALL BE OF THE SAME HEIGHTS AND CONSTRUCTION AS THAT OF ADJOINING SPACE, UNO
8. THE GENERAL CONTRACTOR SHALL PROVIDE CUT-OUTS AND OTHER SPECIAL PROVISIONS IN ACOUSTICAL WORK AS REQUIRED FOR LIGHT FIXTURES, REGISTERS, DIFFUSERS AND OTHER INSERTED ITEMS
11. SUSPENDED CEILINGS (WHERE OCCURS) SHALL BE INSTALLED OR CONSTRUCTED IN ACCORDANCE WITH STATE AND LOCAL CODES AND ASCE 7-05.
12. CABLING TO BE PLENUM RATED AND SUSPENDED FROM THE STRUCTURE ABOVE. CABLING MAY NOT REST ON CEILING GRID OR BE ATTACHED TO ANY OTHER ELEMENTS ABOVE THE CEILING GRID. G.C. TO PROVIDE PULL STRING & OUTLET

G.C. ELECTRICAL NOTES

1. FURNISH AND INSTALL ALL LIGHT FIXTURES AND ELECTRICAL WORK AS SHOWN OR IMPLIED ON ALL DRAWINGS AND NOTES, UNO
2. INSTALL FIXTURES IN ACCORDANCE TO THE MANUFACTURER'S SPECIFICATIONS
3. THE WORK SHALL BE INSTALLED IN A STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, PUBLIC UTILITIES COMPANY, TELEPHONE COMPANY, AND ALL OTHER AUTHORITIES HAVING JURISDICTION
4. ALL NEW MATERIALS REQUIRED SHALL CONFORM WITH THE STANDARDS OF THE UNDERWRITERS LABORATORIES, INC., WHERE SUCH STANDARDS HAVE BEEN ESTABLISHED FOR THE PARTICULAR TYPE OF MATERIAL OR FIXTURE IN QUESTION, UNO
5. PROPOSALS SHALL BE BASED UPON REMOVING AND/OR RE-INSTALLING EXISTING LIGHT FIXTURES (INCLUDING NEW LAMPS), FURNISHING AND INSTALLING NEW LIGHT FIXTURES OF TYPES AND MANUFACTURERS AS INDICATED ON PLANS
6. SUBMIT CUT SHEETS OF ALL FIXTURES AND CONTROLS TO KARDENT FOR REVIEW, KARDENT TO APPROVE PRIOR TO INSTALL
7. ALL DOWNLIGHTS, WALL WASHERS, SPEAKERS, SENSORS, AND OTHER CEILING-MOUNTED FIXTURES SHALL BE CENTERED ON THE 2'X2' OR 2'X4' MODULE CREATED BY CEILING GRIDS AND CEILING TILE SCORE LINE, UNLESS OTHERWISE NOTED. ARCHITECT SHALL BE NOTIFIED OF ANY CONFLICTS.
8. ALL LAMPS SHALL BE IDENTICAL FROM THE SAME MANUFACTURER. CONTRACTOR SHALL REPLACE ALL NON-CONFORMING LAMPS. ALL LAMPS ARE TO BE SINGLE COLOR TEMPERATURE UNO
9. ALL RECESSED FIXTURES SHALL BE SET FLUSH INTO CEILINGS
10. ALL DOWNLIGHTS, WALL WASHERS, ETC. SHALL ALIGN IN A STRAIGHT LINE, UNO
11. ALL EMERGENCY LIGHTING TO BE UPGRADED TO MATCH BUILDING STANDARD/ TITLE 24 REQUIREMENTS, REFER TO ENGINEER DRAWINGS FOR EXACT LOCATIONS. REFER TO G.C. FIRE DEPARTMENT NOTES FOR ADDITIONAL INFORMATION
12. ELECTRICAL SUBCONTRACTOR SHALL COORDINATE ANY ELECTRICAL OR LIGHTING INSTALLATION INTO CABINETWORK (WHERE OCCURS) WITH CABINET SUBCONTRACTOR AS REQUIRED
13. ELECTRICAL SUBCONTRACTOR SHALL COORDINATE ANY TELEPHONE/DATA/SECURITY AND AUDIO-VISUAL REQUIREMENTS WITH THE CLIENT'S VENDORS AS REQUIRED
14. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND ELECTRICAL SERVICE FOR ALL TRADES AS REQUIRED THROUGHOUT DURATION OF CONSTRUCTION
15. WHERE MORE THAN ONE SWITCH OCCURS IN THE SAME LOCATION, THEY SHALL BE INSTALLED IN GANG TYPE BOX UNDER ONE COVER PLATE
16. ALL ELECTRICAL, DATA/TELEPHONE RECEPTACLES AND LIGHT FIXTURES SHALL BE LOCATED WHERE DIMENSIONED ON PLANS. ALL FURNITURE FEEDS/J-BOXES TO BE COORDINATED WITH FURNITURE SUB CONTRACTOR.
17. ALL NEW OUTLETS ON COLUMNS (WHERE OCCURS) WILL BE CENTERED ON FACE, UNO
18. ALL ELECTRICAL, TELEPHONE/DATA RECEPTACLES SHALL BE INSTALLED VERTICALLY AT 18" ABOVE FINISH FLOOR TO CENTER OF BOX. (MINIMUM 15" AFF TO BOTTOM OF BOX)
19. ALL THERMOSTATS AND CONTROL DEVICES SHALL BE A MAXIMUM OF 44" TO THE CENTERLINE ABOVE FINISH FLOOR, UNLESS OTHERWISE NOTED. THERMOSTATS AND LIGHTING CONTROLS OCCURRING WITHIN THE SAME ROOM SHALL BE LOCATED PER TYPICAL INSTALLATION ELEVATION IN DRAWINGS.
20. ALL SIDE BY SIDE OUTLETS SHALL BE NO MORE THAN 6" ON CENTER, APART
21. PROVIDE NEW BLANK COVER PLATES FOR EXISTING RECEPTACLES NOT BEING USED WHEN NOTED. COVER PLATES TO MATCH BUILDING STANDARD, AND/OR TO MATCHING EXISTING, UNLESS OTHERWISE NOTED. CONFIRM WITH ARCHITECT PRIOR TO INSTALLATION
22. RECEPTACLES AT BACK TO BACK LOCATIONS ARE TO BE STAGGERED
23. RECEPTACLES OCCURRING ON MILLWORK OR OTHER FINISH PANELS SHALL BE INSTALLED FLUSH WITH FACE OF MILLWORK, OR FINISHED PANEL
24. TELEPHONE/DATA RECEPTACLES SHALL CONSIST OF A 2-GANG BOX WITH A PULL STRING AND 3/4 " CONDUIT, STUBBED 6" ABOVE CEILING, UNO
25. ALL DIMENSIONS ON THE POWER AND SIGNAL PLAN ARE ON CENTER LINE AS INDICATED, UNO
26. PROVIDE AND INSTALL NEW ELECTRICAL AND DATA AS INDICATED ON DRAWINGS
27. ALL OUTLETS ARE NEW, U.N.O.
28. ALL OUTLETS TO BE MOUNTED AT 15" A.F.F, U.N.O.
29. ALL OUTLETS / COVER PLATES TO BE WHITE U.N.O. CONTRACTOR TO SUBMIT A SAMPLE FOR APPROVAL PRIOR TO ORDERING
30. TOTAL ENERGY CONSUMPTION FOR POWER IS 6.0 WATTS PER SQUARE FOOT OR AS REQUIRED BY LOCAL CODE ENFORCEMENT
31. ELECTRICAL CONTRACTOR TO FIELD VERIFY THAT ALL CIRCUITS AT THE MAIN PANEL ARE ADEQUATE FOR NEW REQUIREMENTS, INSTALL NEW CONDUIT, OR PANELS IF REQUIRED
32. CONTRACTOR MUST COORDINATE ALL ELECTRICAL OUTLETS FOR FURNITURE W/ FURNITURE SUB CONTRACTOR BEFORE PLACEMENT IN FIELD
33. ALL RECEPTACLES WITHIN 6'-0" OF WET LOCATIONS SHALL BE PROTECTED WITH GFCI (GROUND FAULT CIRCUIT INTERRUPT) DEVICES - PER IBC ARTICLE 210-8(B)
34. (E) DENOTES EXISTING ITEMS, ALL OTHERS ARE NEW AND TO BE MOUNTED AT 15" A.F.F, U.N.O. TO BOTTOM OF RECEPTACLE
35. LABEL ALL (JUNCTION BOXES WITH CIRCUITS. LABEL PANELS WITH PREPRINTED TYPE WRITTEN PANEL SCHEDULE
36. PROVIDE SUPPORT FOR ALL CONDUITS ABOVE THE CEILING AS REQUIRED PER CODE

G.C. DRYWALL & PARTITION NOTES

1. PROVIDE AND INSTALL PARTITIONS AS DESIGNATED ON ARCHITECTURAL DRAWINGS AND DETAILS
2. PROVIDE CHALK LINE MARKINGS ON THE FLOOR OF ALL PARTITIONS. ARCHITECT AND CLIENT SHALL BE NOTIFIED TO REVIEW AND APPROVE MARKINGS PRIOR TO FRAMING. SITE MEETING TO REVIEW CHALK LINES SHALL BE SCHEDULED BY THE GENERAL CONTRACTOR THREE (3) DAYS IN ADVANCE OF THE MEETING.
3. ALL WALL DIMENSIONS ARE FINISHED FACE OF WALL TO FINISHED FACE OF WALL, UNO. AT BUILDING PERIMETER, WALLS SHALL BE CENTERED ON MULLIONS, UNO
4. WALLS SHOWN ALIGNED WITH EXISTING PARTITIONS SHALL BE FLUSH AND SMOOTH WITH EXISTING, UNLESS OTHERWISE NOTED
5. PROVIDE METAL CORNER BEADS AT ALL EXPOSED CORNERS AND EXPOSED ENDS IN PLASTER AND DRYWALL PARTITIONS
6. ALL PARTITIONS SHALL BE ANCHORED FIRMLY AS PER MANUFACTURER'S SPECIFICATIONS AND AS REQUIRED BY STATE AND LOCAL CODES
7. CLOSE AND/OR PATCH AS REQUIRED ALL OPENINGS TO MATCH IMMEDIATE ADJACENT AREAS IN MATERIAL AND FIRE RATING. WHERE OPENINGS OCCUR IN EXISTING FIRE RATED FLOOR ASSEMBLY OR PARTITIONS, DUE TO EXISTING OR NEW CONDUIT RUNS, DUCTWORK, CABLES, PIPING, ETC. AND/OR WHERE EXISTING FIREPROOFING HAS BEEN REMOVED AS A RESULT OF EXISTING OR NEW CONSTRUCTION WORK. KARDENT IS TO BE NOTIFIED OF ANY REQUIRED DEVIATION FROM CODE CONSTRUCTION DIMENSIONS OR CLEARANCES AS DESIGNATED ON PLAN OR OF ANY APPARENT CONSTRUCTION CONFLICTS
8. GYPSUM BOARD MATERIALS AND ACCESSORIES SHALL BE IDENTIFIED BY THE MANUFACTURER'S DESIGNATION TO INDICATE COMPLIANCE WITH THE APPROPRIATE STANDARDS REFERENCED IN THIS SECTION AND STORED TO PROTECT SUCH MATERIALS FROM THE WEATHER. (CBC 1021.1)
10. GYPSUM BOARD MATERIALS SHALL CONFORM TO THE APPROPRIATE STANDARDS LISTED IN TABLE 2506.2 AND CHAPTER 35 AND, WHERE REQUIRED FOR FIRE PROTECTION, SHALL BEAR LABELS OF APPROVED AGENCIES (CHAPTER 7
11. WATER-RESISTANT GYPSUM BACKING BOARD SHALL NOT BE USED IN THE FOLLOWING LOCATIONS (CBC 2509.3 LIMITATIONS):
   A. OVER A VAPOR BARRIER IN A SHOWER OR BATHTUB COMPARTMENTS
   B. WHERE THERE WILL BE DIRECT EXPOSURE TO WATER OR IN AREAS SUBJECT TO CONTINUOUS HIGH HUMIDITY
   C. ON CEILINGS WHERE FRAME SPACING EXCEEDS 12 INCHES (305 MM) O.C. FOR 1/2-INCH-THICK (12.7 MM) WATER-RESISTANT GYPSUM BACKING BOARD AND MORE THAN 16 INCHES (406 MM) O.C. FOR 5/8-INCH-THICK (15.9 MM) WATER-RESISTANT GYPSUM BACKING BOARD
12. INSTALL GYPSUM BOARD PANELS IN ACCORDANCE WITH ASTM 754
13. GYPSUM BOARD AT "WET" LOCATIONS SHALL BE CEMENTITIOUS BOARD
14. PROVIDE ACCESS PANELS AS REQUIRED FOR ACCESS TO ALL MECHANICAL, ELECTRICAL AND PLUMBING ACCESS AS REQUIRED; KARDENT TO REVIEW AND APPROVAL ALL LOCATIONS PRIOR TO INSTALLATION
15. FIRE RATED PARTITIONS SHALL HAVE DAMPERS OF THE APPROPRIATE SIZE AND RATING, ALL PENETRATIONS MUST BE FIRE CAULKED, ALL SEAMS TO RECEIVE FIRE TAPE. ALL PENETRATIONS SHALL BE PROTECTED PER APPROVED "UL" METHODS
16. FOR PARTITIONS UNDER 10' HIGH OR MORE VERTICALLY INSTALLATION, FOR PARTITIONS OVER 10' HIGH USE HORIZONTAL INSTALLATION WITH STAGGERED PANELS
17. SOUND BATT INSULATION WHERE SCHEDULED SHALL COMPLY WITH ASTM C 665
18. CONSTRUCT RETURN AIR OPENINGS IN SLAB TO SLAB PARTITIONS ABOVE HUNG CEILINGS. SIZE OF OPENING TO MATCH AREA CALCULATION REQUIREMENTS AS SHOWN ON ENGINEERING DRAWINGS. ALL OPENINGS IN DEMISING AND SOUND ATTENUATED WALLS SHALL HAVE SOUND BAFFLES APPROPRIATELY SIZED FOR PROPER OPERATION OF HVAC SYSTEM. OPENINGS IN FIRE RATED WALLS SHALL HAVE FIRE DAMPERS AS REQUIRED BY LOCAL BUILDING CODES. CONTRACTOR TO COORDINATE WITH ENGINEERING DRAWINGS AND INFORM KARDENT OF DISCREPANCIES PRIOR TO FINAL BIDDING
19. PROVIDE SUFFICIENT FRAMING FOR ALL WALL PENETRATIONS FOR DUCT WORK, RETURN AIR OPENINGS AND GRILL OPENINGS ABOVE AND BELOW SUSPENDED CEILINGS. THESE ARE TO BE COORDINATED WITH MECHANICAL ENGINEERING DRAWINGS AND THE GENERAL CONTRACTOR'S SUBCONTRACTOR'S SHOP DRAWINGS. ALL OPENINGS SHALL BE PROPERLY SEALED FOR SOUNDPROOFING AND VIBRATION
20. NOTIFY KARDENT SHOULD PARTITION HEIGHT EXCEED STUD MANUFACTURER'S ALLOWABLE HEIGHT CHART

G.C. GENERAL FINISH NOTES

1. SUBMIT THREE (3) SAMPLES OF EACH FINISH TO KARDENT FOR REVIEW INCLUDING SEAMING/PATTERN LAYOUTS AS APPLICABLE PRIOR TO PURCHASE AND INSTALLATION.
2. ALL FINISHES SHALL BE BID AS SPECIFIED, ANY SUBSTITUTIONS MUST BE APPROVED BY KARDENT PRIOR TO SUBMISSION OF BID
3. ALL INTERIORS AND FINISHES SHALL COMPLY WITH LOCAL AND STATE CODES, THE CONTRACTOR SHALL NOTIFY KARDENT IMMEDIATELY UPON DISCOVERY OF NON COMPLIANT FINISHES
4. ALL FINISHES SHALL BE INSPECTED UPON ARRIVAL TO THE JOB SITE FOR DEFECTS AND DYE LOT CONSISTENCY. NOTIFY KARDENT OF ANY DEFECT PRIOR TO INSTALLATION
5. ALL FINISHES SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS
6. ALL SURFACES SHALL BE PREPARED APPROPRIATELY TO RECEIVE SPECIFIED FINISHES
7. ENSURE ALL HOLES, SCRAPES AND GOUGES HAVE BEEN PATCHED AND PREPARED TO RECEIVE NEW FINISHES
8. PROTECT NEW INSTALLED FINISHES FROM DAMAGE THAT MAY OCCUR BY OTHER TRADES DURING DEMOLITION OR CONSTRUCTION
   EXAMINE ALL FINISH SURFACES AFTER COMPLETION OF WORK AND PROCEED WITH TOUCH UP AS REQUIRED
10. ALL FINISHES SHALL BE LEFT IN "LIKE NEW" CONDITIONS
11. IN SOUND RATED ROOMS, ALL WALL AND FLOOR PENETRATIONS FOR PIPES DUCTS AND OUTLETS SHALL BE SEALED WITH AN ACOUSTIC SEALANT, AND CONCEALED OR RECESSED FIXTURES SHALL BE COVERED OR BACKED WITH A SOUND ATTENUATION BLANKET.

G.C. GENERAL WALL FINISH NOTES

1. SUBMIT THREE (3) PAINT DRAW DOWN SAMPLES (8.5"X11") OF EACH FINISH FOR KARDENT TO REVIEW PRIOR TO PURCHASE AND INSTALLATION. PROVIDE SEAMING DIAGRAM AND/OR PATTERN LAYOUT (WHERE OCCURS).
2. WALLS SHALL INCLUDE SURFACES FROM FLOOR TO CEILING, INCLUDING PILASTERS, FASCIAS, AND ALL VERTICAL SURFACES NOT INCLUDED IN CEILING, UNO.
3. ALL WALLS AND CEILINGS SHALL BE PROPERLY PREPARED, PATCHED, SANDED, ETC. TO PROVIDE A LEVEL 4 FINISH. PROVIDE LEVEL 5 FINISH ONLY WHERE INDICATED ON PLAN.
4. ALL OPEN PORES IN WOOD SHELVING AND PAINTED DOORS SHALL BE FILLED AND SHALL RECEIVE PRIMING, SANDING AND TWO FULL FINISH COATS FREE OF BRUSH MARKS, UNLESS OTHERWISE NOTED. GLOSS FINISH PER SCHEDULE.
5. REMOVE ALL ELECTRICAL SWITCH AND RECEPTACLE PLATES, SURFACE HARDWARE, ETC., AND PROTECT EXPOSED AREAS PRIOR TO PAINTING. REINSTALL OR REPLACE ANY DAMAGED PLATES OR HARDWARE WHEN PAINTING HAS BEEN COMPLETED. CONTRACTOR SHALL REMOVE ALL PAINT FROM SURFACES WHERE SPILLS, SPLASHES OR SPLATTERS HAVE OCCURRED, INCLUDING BUT NOT LIMITED TO LIGHT FIXTURES, DIFFUSERS, REGISTERS, ETC.
6. USE A LATEX BASE PAINT IN COLORS AND FINISHES SELECTED BY ARCHITECT. PROPERLY PREPARE ALL SURFACES TO RECEIVE ONE (1) PRIMER COAT AND TWO (2) FINISH COATS OF PAINT IN COLOR SELECTED BY ARCHITECT, INCLUDE ADDITIONAL FINISH COATS AS REQUIRED TO ACHIEVE COLOR TO MATCH CONTROL SAMPLE.
7. UNEVENNESS IN EXISTING PARTITIONS SHALL BE SANDED OR CHIPPED AWAY AND SURFACE PATCHED TO INSURE A PERFECTLY EVEN SURFACE.
8. EXAMINE ALL AREAS OF CONSTRUCTION AFTER COMPLETION OF WORK BY ALL TRADES (INCLUDING TELEPHONE INSTALLATION, FLOORING, ETC.) AND COMPLETE ALL NECESSARY "TOUCH-UP" PAINTING AND /OR PATCHING PRIOR TO SCHEDULING A PUNCH WALK.
9. IT IS THE INTENT OF THE DRAWINGS THAT ALL EXPOSED SURFACES RECEIVE FINISHES UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. ANY SURFACES WHICH DO NOT HAVE A SPECIFIC FINISH NOTED, OR ARE NOTED TO REMAIN UNFINISHED, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND FINISHED PER ARCHITECT'S INSTRUCTIONS.
10. TREAT JOINTS AND FASTENERS IN GYPSUM BOARD IN ACCORDANCE WITH GYPSUM ASSOCIATION GA-214
11. RE-PAINT ALL EXISTING METAL SURFACES, INCLUDING HOLLOW METAL DOOR FRAME, FIRE EXTINGUISHER CABINETS, ACCESS PANELS, ETC.
12. WHEN PAINTING PUBLIC CORRIDORS, ELEVATOR LOBBIES, STAIRWAYS, COMMON AREA RESTROOMS, ETC. CHECK WITH BUILDING MANAGEMENT FOR BUILDING STANDARD FINISH SPECIFICATIONS AND IN-STOCK AVAILABILITY
13. CONTRACTOR TO PREPARE ALL WALLS (NEW & EXISTING) TAPED, SANDED AND SMOOTH TO RECEIVE NEW APPROVED WALL FINISH

G.C. FIRE DEPARTMENT NOTES

1. PROVIDE EXIT SIGNS ILLUMINATED INTERNALLY OR EXTERNALLY TO A MINIMUM INTENSITY LEVEL OF 5 FT CANDLES. TWO LAMPS SHALL BE ENERGIZED FROM SEPARATE CIRCUITS. ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES WIRING SYSTEM. IN THE EVENT OF FAILURES TO THIS SYSTEM, ILLUMINATION SHALL BE AUTOMATICALLY PROVIDED FROM AN EMERGENCY SYSTEM. EMERGENCY LIGHTING SHALL GIVE A VALUE OF ONE FOOT CANDLE AT FLOOR LEVEL. (TITLE 24, CFC)
2. PROVIDE SMOKE DETECTORS AS REQUIRED BY THE LOCAL FIRE DEPARTMENT, STATE AND FEDERAL GOVERNMENT HAVING JURISDICTION
3. EXIT PATH LIGHTING SHALL BE PROVIDED AT 1 FT CANDLE AT FLOOR LEVEL (CFC 1006.2) FROM STAIRWAY, HALLWAY, EXIT PASSAGEWAY AND EGRESS TO A PUBLIC WAY ANY TIME THE BUILDING IS OCCUPIED
4. PROVIDE PORTABLE FIRE EXTINGUISHERS AND INSTALL IN NEW AND EXISTING OCCUPANCIES PER CFC 906 WITH A RATING OF NOT LESS THAN 2A:10B:C WITHIN 75 FEET TRAVEL DISTANCE TO ALL PORTIONS OF THE BUILDING ON EACH FLOOR. REFER TO PARTITION PLAN FOR LOCATIONS. GENERAL CONTRACTOR TO PROVIDE ONSITE FULLY CHARGED FIRE EXTINGUISHERS THROUGHOUT THE DURATION OF DEMOLITION AND CONSTRUCTION.
5. PROVIDE EXIT SIGNS AND DIRECTIONAL EXIT SIGNS WITH A MINIMUM OF 6" HIGH BY 3/4" STROKE BLOCK LETTERS ON A CONTRASTING BACKGROUND. DIRECTIONAL EXIT SIGNAGE SH

CAUTION: IF THIS PRINT IS NOT 30"X42" THEN IT IS A REDUCED PRINT

CONSTRUCTION AND DEMOLITION MATERIALS CONVERSION WORKSHEET

Use this worksheet to convert from common construction units to TONS. This worksheet can be used to complete a Waste Management Plan (WMP) or Recycling Summary Report (RSR), but it does not have to be completed or submitted. WMPs and RSRs should be submitted with all materials listed in TONS.

Step 1. Calculate scrap or waste quantity for each material in typical units (square feet, board feet, or cubic yards). Calculate from materials take offs and waste factors. Enter into Column 1.

Step 2. Multiply by the conversion factor in Column II and input answer in Column III.

Step 3. Transfer the TONS listed in Column III to the Waste Management Plan (WMP) or Recycling Summary Report (RSR), Column A, (page 5) and follow the directions on those forms.

Material Category	Column I Volume		Column II Tons/Unit		Column III Tons
		Unit			
Asphalt/Concrete					
Asphalt (broken)		CY	0.7	=	
Concrete (broken)		CY	0.9	=	
Concrete (solid slab)		CY	1.3	=	
Brick/Masonry/Tile					
Brick (broken)		CY	0.7	=	
Brick (whole, palletized)		CY	1.512	=	
Masonry block (broken)		CY	0.6	=	
Tile		SF	.00175	=	
Building Materials (doors, fixtures, windows, plate glass, cabinets)		CY	.15	=	
Cardboard		CY	.05	=	
Carpet					
flat		SF	.0005	=	
loose		CY	.3	=	
Carpet Padding/Foam					
flat		SF	.0000002	=	
loose		CY	.00013	=	
Ceiling Tiles					
Whole (Palletized)		SF	.0003	=	
loose		CY	.0875	=	
Drywall, new or used					
½"		SF	.0008	=	
5/8"		SF	.00105	=	
mixed		CY	.25	=	
Scrap Metal		CY	.453	=	
Wood & Pallets (no pressure-treated lumber)					
clean, unpainted		BD FT	.00138	=	
loose		CY	.15	=	
Non-Recyclable Debris		CY	.175	=	
Recyclable Mixed Debris		CY	.175	=	

CY – Cubic Yards, SQ FT = Square Feet, BD FT = Board Feet

Be prepared to provide weight receipts or other verifiable documents.

WHAT ARE CONSTRUCTION AND DEMOLITION MATERIALS?

Materials	Components
Wood	Lumber, plywood, scraps, laminates (no pressure-treated wood)
Drywall	Sheetrock, gypsum, plaster
Metals	Pipes, rebar, flashing, steel, aluminum, copper, brass, stainless steel
Plastics	Vinyl siding, doors, windows, floor tiles, pipes
Roofing	Asphalt & wood shingles, slate, tile, roofing felt
Rubble	Asphalt, concrete, cinder block
Brick	Bricks and decorative blocks
Glass	Windows, mirrors, lights
Miscellaneous	Carpeting, fixtures, insulation, ceramic tile

COMPLIANCE

Diversion of debris to a recycling facility does not require an additional step by the contractor or homeowner/builder. The difference is where the debris is hauled – to a recycling facility instead of a landfill.

The same methods of collection or containment that are used for waste disposal can be used for recycling. Typically, a bin from a waste hauling company is rented to contain and transport the debris from the job site. Many of the waste haulers licensed to do business in the City already recycle the construction and demolition debris they transport because they find it a savings to do so. Using one of the waste haulers that already recycles debris is an acceptable method of meeting the requirements of the California Green Building Standards Code.

Sorting the waste into different types of materials is not required or necessary to recycle. The debris can be taken to Material Recovery Facilities (MRFs) that accept and sort co-mingled debris. By pre-sorting the debris, however, the contractor or homeowner could get money back from the recycling facility for certain materials.

ESTIMATION OF DEBRIS TONNAGE

This chart below illustrates the typical amount of construction debris created in pounds per square foot for the most common types of residential and non-residential projects.

ESTIMATED DEBRIS GENERATION (pounds per square foot)

Reroofs
- Shingles Only 2.5 lbs/sf
- Shingles & Sheathing 5.0 lbs/sf

Residential Construction
- New 4.5 lbs/sf
- Demolition 115.0 lbs/sf
- Renovation 24.0 lbs/sf

Non-Residential Construction
- New 4.0 lbs/sf
- Demolition 155.0 lbs/sf
- Renovation Medical Office 3.0 lbs/sf
- Renovation Tenant Improvement 5.0 lbs/sf
- Renovation Retail Space 10.0 lbs/sf

CALGREEN CODE - CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

4.408.1, 5.408.1 Construction waste management. Recycle and/or salvage for reuse a **minimum of 65%** of the nonhazardous construction and demolition waste in accordance with either Section 4.408.1, 5.408.1.

4.408.2, 5.408.1.1 Construction waste management plan. Submit a construction waste management plan meeting Items 1 through 5 of Section 4.408.2 or Items 1 through 4 of Section 5.408.1.1.

4.408.3, 5.408.1.2 Waste management company. Utilize a waste management company, approved by the City of El Segundo, which can provide verifiable documentation that diverted construction and demolition waste materials meet the requirements in Section 4.408.2 or 5.408.1.2.

4.408.4, 5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed 3.4 pounds per square foot of building area (4.408.4) or 2.0 pounds per square foot of building area (5.408.1.3) may be deemed to meet the 65 percent minimum requirement as approved by the El Segundo Building Safety Division.

4.408.5, 5.408.1.4 Documentation. Documentation shall be provided to the inspector which demonstrates compliance with Sections 4.408.2, 4.408.3, or 4.408.4 or 5.408.1.1 through 5.408.1.3.

5.408.3 Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.

METHODS OF COMPLIANCE

1. The contractor shall develop and maintain a waste management plan and document diversion and disposal, OR
2. Utilize a waste management company that certifies a minimum 65% waste diversion, OR
3. Waste stream reduction alternative.
   - Non-residential new construction projects with a combined disposal weight of less than 2 pounds per square foot may be deemed to meet the 65% minimum diversion requirement.
   - Residential low rise (3 stories or less) with a combined weight of new construction disposal less than 3.4 pounds per square foot may be deemed to meet the 65% minimum diversion requirement.
   - Residential high rise (4 stories or more) with a combined weight of new construction disposal less than 2 pounds per square foot may be deemed to meet the 65% minimum diversion requirement.

RECYCLING BY OCCUPANTS (SPACE FOR RECYCLING)

Newly constructed non-residential buildings, certain non-residential additions and multi-family housing with ≥ 5 units should provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at minimum) paper, corrugated cardboard, glass, plastics, organic waste and metals. (4.410.2, 5.410.1)

UNIVERSAL WASTE (NON-RESIDENTIAL PROJECTS)

Universal waste (as defined in CALGreen Section 202) including batteries, electronic devices, mercury-containing equipment, lamps, cathode ray tubes, cathode ray tube glass, aerosol cans from non-residential addition and alteration projects shall require verification that the materials are disposed of properly and diverted from landfills. A list of prohibited universal waste materials shall be included in the construction documents. This is required for non-residential projects subject to the requirements of the California Green Buildings Standards Code (additions of 1,000 square feet or greater and/or building alterations with a permit valuation of $200,000 or more (CALGreen Sections 301.3 and 5.408.2)

Building and Safety
City of El Segundo
350 Main Street, El Segundo,
California 90245-3895
(o) 310-524-2380
Permits@elsegundo.org
https://www.elsegundo.org/government/departments/community-development/building-and-safety-division

WASTE REDUCTION AND RECYCLING PLAN
Compliance Report
2022 CALGREEN CODE
Effective January 1, 2023

CONSTRUCTION WASTE MANAGEMENT PLAN REQUIRED

California Green Building Standards Code Sections 4.408 and 5.408 require the submittal of a construction waste management plan or the submittal of certified waste management facility receipts prior to final inspection. The Certificate of Occupancy (CO) and Temporary Certificate of Occupancy (TCO) cannot be issued without complete documentation and recycling facility receipts.
Submit the complete form and documentation with original recycling facility receipts prior to final inspection. Original, dated recycling facility receipts showing project addresses are required.

PROJECT INFORMATION

Plan Check Number: | Project Address: 348 MAIN ST. EL SEGUNDO, 90245

Description of Work: RENOVATION OF EXISTING EOC. FINISH AND TECHNOLOGY UPGRADES

Project Type: ◯ Alteration ◯ Construction ◯ Demolition ◯ Addition (Residential) ◯ Addition (Commercial) ◉ Tenant Improvement

Estimated Square Footage: | Start Date: | Completion Date:

PROJECT OWNER CONTACT INFORMATION

Name: JAMES RICE
Company: CITY OF EL SEGUNDO PUBLIC WORKS
Address: 350 MAIN STREET
City: EL SEGUNDO
Daytime Phone: 310-524-2316 | Cell Phone: | Email: JRICE@ELSEGUNDO.ORG

REQUIRED DIVERSION AND ACKNOWLEDGEMENT

Project Type	Alteration
Project Area (square feet)	435
Estimated Debris Weight (lbs)	500
Required Diversion (Multiply Weight by 0.65)	325

I hereby certify that I have read and state that this information is correct. I understand that the project final approval may be withheld until I comply with California Green Building Standards Code 4.408 or 5.408 which require a minimum of 65% construction and demolition waste diversion or the use of a certified waste management company.

Applicant Signature | Date

WASTE MANAGEMENT PLAN (WMP)/RECYCLING SUMMARY REPORT (RSR)
PROJECT DIVERSION ACHIEVED

Verifiable Project Diversion-Waste Reduction and Recycling Plan (Salvage, Reuse or Recycle): Fill out the following table with estimated tonnage for each material that will be generated (A = B + C). Original tags documenting this diversion are required. These tags will NOT be returned. If conversion factors are needed to convert weights, visit http://www.calrecycle.ca.gov/

Material Type	A. Estimated Total Debris Quantity (tons)	B. Estimated Salvage, Reuse, or Recycle (tons)	C. Estimated Disposal (Trash) (tons)	Hauler	Certified Recycling Facility or Disposal Destination
Asphalt and Concrete					
Brick/Masonry/Tile					
Cabinets, *Doors, Fixtures, Windows (Circle applicable)					
Cardboard					
Carpet/Padding/Foam					
Ceiling Tile (acoustic)					
Dirt					
Drywall					
Landscape Debris					
Mixed C & D Debris					
Mixed Inerts					
Roofing Materials					
Scrap Metal					
Stucco					
Universal Waste					
Unpainted Wood & Pallets					
Garbage/Trash					
Other					
TOTAL					

Determine the Project's Overall Recycling Rate (Percentage): [Total B/Total A] x 100 = ____%

Example:

TOTAL	20,000	13,400	6,000		

OVERALL RECYCLING RATE: 13,400/20,000 = .67 X 100 = 67%

Project Notes (if needed):

List of Authorized Commercial Franchise Waste Haulers Servicing the Unincorporated Areas of Los Angeles County
(in alphabetical order)

	Hauler Name	Customer Service Number	Office Hours	Address	Website	Dumpster Service	Roll-Off/Bin Rental Service	Food Waste Service*	Green Waste Service*
1	AAA Rubbish, Inc.	(800) 310-2248	Mon to Fri 7 am - 5 pm	6920 Foster Bridge Blvd. Bell Gardens, CA 90202	www.aaarubbish.com	✓	✓	Y	Y
2	American Reclamation, Inc.	(888) 999-9330	Mon to Fri 6 am - 5 pm Sat 6 am - 3 pm	4560 Doran St. Los Angeles, CA 90039	www.americanreclamationinc.com	✓	✓	Y	Y
3	Arrow Disposal Service	(626) 336-2255	Mon to Fri 6 am - 5:30 pm Sat 7 am - 12 pm	14245 Proctor Ave. La Puente, CA 91746	www.arrowdisposalservices.com		✓	S	S
4	Athens Services	(888) 336-6100	Mon to Fri 7 am - 5 pm Sat 7 am - 12 pm	15045 Salt Lake Ave, City of Industry, CA 91746	www.athensservices.com	✓	✓	Y	Y
5	Burrtec Waste Industries, Inc.	(800) 325-9417	Mon to Fri 8 am - 5 pm	1017 W. Gladstone St. Azusa, CA 91702	www.burrtec.com	✓	✓	Y	Y
6	California Waste Services, LLC	(800) 839-5550	Mon to Fri 7 am - 5 pm	621 W. 152nd St. Gardena, CA 90247	www.californiawasteservices.com		✓	S	S
7	Calmet Calsan Inc. & Metropolitan	(562) 259-1239	Mon to Fri 8 am - 5 pm	7202 Petterson Lane Paramount, CA 90723	www.calmetservices.com	✓	✓	Y	Y
8	Consolidated Disposal Services/ Allied Waste Services	(800) 299-4898	Mon to Fri 7 am - 5 pm Sat 7 am - 12 pm	12949 Telegraph Rd. Santa Fe Springs, CA 90670	www.republicservices.com	✓	✓	Y	Y
9	C R & R Incorporated	(800) 826-9677	Mon to Fri 8 am - 5 pm	11292 Western Ave. Stanton, CA 90680	www.crrwasteservices.com	✓	✓	Y	Y
10	EDCO Disposal Corporation	(619) 287-7555	Mon to Fri 7:30 am - 5:30 pm Sat 8 am - 12 pm	P.O. Box 116 Lakewood, CA 90714	www.edcodisposal.com	✓	✓	Y	Y
11	Haul-Away Rubbish Service Co.	(323) 721-0371	Mon to Fri 8 am - 4 pm	1205 Date St. Montebello, CA 90640	www.haulawayrubbish.com	✓	✓	Y	Y
12	Heritage Disposal	(626) 576-7325	Mon to Fri 8 am - 4 pm	704 S. Date Ave. Alhambra, CA 91803	www.heritagedisposal.com		✓	S	S
13	Interior Removal Specialist, Inc.	(323) 357-6900	Mon to Fri 8 am - 5 pm Sat 8 am - 4 pm	8990 Atlantic Ave. South Gate, CA 90280	www.irsdemo.com		✓	S	S

For more information, please call Los Angeles County's Trash Collection Hotline at (888) CLEAN- LA Monday-Thursday, 7 a.m. to 5 p.m. or visit www.businessrecycling.com

*** Denotes commercial waste haulers that**
Y=yes-offers food waste and/or green waste collection service.
S=hauler sub-hauls the service to another authorized hauler
P=pending

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updated September 2022

List of Authorized Commercial Franchise Waste Haulers Servicing the Unincorporated Areas of Los Angeles County
(in alphabetical order)

	Hauler Name	Customer Service Number	Office Hours	Address	Website	Dumpster Service	Roll-Off/Bin Rental Service	Food Waste Service*	Green Waste Service*
14	Mountainside Disposal	(661) 831-2837	Mon to Fri 8 am - 4 pm	8665 S. Union Ave. Bakersfield, CA 93307	www.pricedisposal.com	✓	✓	Y	Y
15	Nasa Services, Inc.	(888) 888-0388	Mon to Fri 7 am - 5 pm Sat 7 am - 12 pm	1100 S Maple Ave. Montebello, CA 90640	www.nasaservices.com	✓	✓	Y	Y
16	Patriot Services, Inc.	(323) 838-9375	Mon to Fri 8 am - 5 pm	P.O. Box 145 Montebello, CA 90640	http://www.patriotservinc.com		✓	Y	Y
17	Randfam Inc./Rent-A-Bin	(818) 709-5599	Mon to Fri 8 am - 4 pm Sat 8 am - 1 pm	9643 Cozycroft Ave. Chatsworth, CA 91311	www.rent-a-bin.com		✓	Y	Y
18	Serv-Wel Disposal Service/ A Rent-A-Bin	(888) 768-2246	Mon to Fri 7 am - 3:30 pm Sat 7 am - 12 pm	901 S. Maple Ave. Montebello, CA 90640	www.servwel.com	✓	✓	Y	Y
19	Southland Disposal Company	(323) 780-7150	Mon to Fri 7 am - 5 pm Sat 7 am - 1 pm	1525 Fishburn Ave. Los Angeles, CA 90063	www.southlanddisposal.com	✓	✓	Y	Y
20	Universal Waste Systems, Inc.	(800) 631-7016	Mon to Fri 8 am - 12 pm	9016 Norwalk Blvd. Santa Fe Springs, CA 90670	www.uwscompany.com	✓	✓	Y	Y
21	Valley Vista Services, Inc.	(800) 442-6454	Mon to Fri 8 am - 5 pm Sat 8 am - 1 pm	17445 East Railroad St. City of Industry, CA 91748	www.valleyvistaservices.com	✓	✓	Y	Y
22	Ware Disposal, Inc.	(877) 714-9273	Mon to Fri 7 am - 5:30 pm Sat 7 am - 3 pm	1035 East 4th St. Santa Ana, CA 92701	www.wasdisposal.com	✓	✓	Y	Y
23	Waste & Recycling Services, Inc.	(562) 945-2688	Mon to Fri 8 am - 5 pm	13714 Chestnut St. Whittier, CA 90605	www.4wrs.com	✓	✓	Y	Y
24	Waste Management Antelope Valley	(661) 947-7197	Mon to Fri 8 am - 5 pm	1200 West City Ranch Rd. Palmdale, CA 93551	www.wm.com	✓	✓	Y	Y
25	Waste Management San Gabriel Valley	(626) 539-9686	Mon to Fri 8 am - 5 pm	13940 East Live Oak Ave. Baldwin Park, CA 91706	www.wm.com	✓	✓	Y	Y
26	Waste Management Los Angeles Metro Area	(888) 905-9279	Mon to Fri 8 am - 5 pm	1970 East 213th St. Long Beach, CA 90810	www.wm.com	✓	✓	Y	Y
27	Waste Management/G.I. Industries	(805) 522-9400	Mon to Fri. 8 am - 5 pm	195 West Los Angeles Ave. Simi Valley, CA 93065	www.wm.com	✓	✓	Y	Y

For more information, please call Los Angeles County's Trash Collection Hotline at (888) CLEAN- LA Monday-Thursday, 7 a.m. to 5 p.m. or visit www.businessrecycling.com

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Y=yes-offers food waste and/or green waste collection service.
S=hauler sub-hauls the service to another authorized hauler
P=pending

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updated June 2022

Construction and Demolition Debris Recycling Facilities in Los Angeles County

All (Mixed) Debris— Wood, drywall, metal, cardboard, Inert Debris, Land Clearing Debris, Soil

Location	Facility Name	Phone
Canyon Country	Randfam/Rent-A-Bin[h]	(661) 250-5333
Gardena	California Waste Services[h]	(800) 839-5550
Lancaster	WM - Lancaster Landfill	(661) 726-3468
Long Beach	American Industrial Services	(800) 500-3881
Los Angeles (Downtown)	WM - Downtown Diversion	(213) 612-5005
Los Angeles (East LA)	Direct Disposal[*]	(323) 262-1604
Los Angeles (near Glendale)	American Reclamation[h]	(323) 245-0125
Pacoima	Cordova Construction Services	(818) 896-0509
Palmdale	WM - Palmdale Landfill[h]	(661) 947-7197
Santa Clarita	Burrtec Services[h]	(866) 270-5370
Santa Clarita	Republic Services	(800) 299-4898
Santa Monica	Southern California Disposal	(310) 828-6444
South Gate	Construction and Demolition Recycling, Inc.	(323) 357-6900
Sun Valley	Crown Recycling Services	(800) 633-9933
Sun Valley	WM - East Valley Diversion	(818) 252-0019

Inert Debris Only — Asphalt, asphalt concrete, concrete, concrete blocks, gravel, rocks, soil

Location	Facility Name	Phone
Lancaster	Arrow Transit Mix, Inc.	(661) 945-7600
Long Beach (North)	Hanson Aggregates	(626) 856-6700, Option 1
Long Beach (South)	Hanson Aggregates	(636) 856-6700, Option 1
Los Angeles (Boyle Heights)	Security Paving Company, Inc. (formerly 25th Street Recycling)	(818) 362-9200
Los Angeles (South)	Grit & Gravel, Inc. **(does not accept soil)**	(424) 800-3831
Monrovia	Peck Road Gravel	(626) 574-1855
Sun Valley	AMH Recycling	(818) 768-5202, ext. 245
Sun Valley	Vulcan Materials	(818) 983-0146
Sun Valley	RAMCO **(does not accept soil)**	(818) 767-0700
Sun Valley	Security Paving Company, Inc. (formerly Bradley Recycling)	(818) 362-9200

Land Clearing Debris — Green waste, clearing and grubbing

Location	Facility Name	Phone
Granada Hills	North Hills Recycling	(818) 831-7980
Newhall	Foothill Soils, Inc.*[h]	(661) 254-1045
Pomona	Recycled Wood Products*[h]	(909) 868-6882
Santa Fe Springs	Greencycle*[h]	(562) 906-5223
Sun Valley	WM - Bradley East Transfer Station	(818) 767-6180

Deconstructed Material Only

Location	Facility Name	Phone
Los Angeles (Boyle Heights)	Freeway Building Materials	(323) 261-8904
Los Angeles (Boyle Heights)	Southern California Architectural Salvage	(213) 623-3119
Los Angeles (near Glendale)	The Reuse People	(818) 244-5635
Pasadena	Pasadena Architectural Salvage	(626) 535-9655

[h] This facility is also a County authorized commercial waste hauler that may provide roll-off bin service
*This facility also accepts soil.

If you are a recycling company and you would like to be added to this list or you have information to update the existing list, please contact the C&D Unit at (626) 458-3517, or CND@pw.LACounty.gov.

The information presented above is subject to change without notice, and is based on the most readily available information. The facilities listed are not endorsed or recommended by Los Angeles County, nor is the list necessarily inclusive of all recycling facilities in the region.

KARDENT
ARCHITECTURE | DESIGN
11 Golden Shore, Suite 540 | Long Beach | CA 90802 | 562.436.9900
ARCHITECT:
LICENSED ARCHITECT GURDARSHAN TALWAR C-35088 March 31, 2027 CIVIL STATE OF CALIFORNIA
DATE SIGNED: 05/01/26
CONSULTANT:

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REVISIONS:

NO.:	DATE:	DESCRIPTION:
	05/01/26	PLAN CHECK
	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS
CENTER (EOC)
348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
BUILDING & SAFETY

SHEET NUMBER:
A-0.2

PROJECT:	SCALE:	DATE:
10389.17	AS NOTED	FEB 2026

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PLAN CHECK NUMBER 348 MAIN ST, EL SEGUNDO, CA 90245

P:\KARDENT DESIGN\PROJECTS\10389.1 EL SEGUNDO - FINANCE DEPT\DRAWING FILES\WL_CONDOCS\10389.17_A-0.2 BUILDING & SAFETY NOTES.DWG

CAUTION: IF THIS PRINT IS NOT 30"X42" THEN IT IS A REDUCED PRINT

PLANNING AND BUILDING SAFETY
350 Main Street
El Segundo, CA 90245
Phone: (310) 524-2380
Fax: (310) 322-4167
elsegundo.org

CERTIFICATE OF COMPLIANCE FOR WATER-CONSERVING PLUMBING FIXTURES

The purpose of this certificate is to certify the installation of water-conserving plumbing fixtures within existing buildings built and available for use on or before January 1, 1994, in lieu of an inspection when a permit is issued for building alterations or improvements. **A signed copy of this certificate shall be submitted to the Building Inspector prior to final inspection.** Existing noncompliant plumbing fixtures must be replaced with water-conserving plumbing fixtures in accordance with SB 407 (CA Civil Code Sections 1101.1-1101.8), which is attached to and part of this certification form.

Property Address: 350 Main St
Permit #(s): COM-25-45
Unit number (e.g., Unit A, #203, etc.) when applicable: _____

Per Civil Code Section 1101.3, non-compliant plumbing fixture means any of the following:
(1) Any toilet manufactured to use more than 1.6 gallons of water per flush.
(2) Any urinal manufactured to use more than one gallon of water per flush.
(3) Any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute.
(4) Any interior faucet that emits more than 2.2 gallons of water per minute.

Water-conserving plumbing fixture means any fixture that is in compliance with current building standards applicable to a newly constructed real property of the same type.

Exceptions: Per Civil Code Section 1101.7, this article shall not apply to any of the following (if applicable circle exception):
a) Registered historical sites.
b) Real property for which a licensed plumber certifies that due to age or configuration of the property or its plumbing, installation of water-conserving plumbing fixtures is not technically feasible. (Certification below must be signed by licensed plumbing contractor).
c) A building for which water service is permanently disconnected.
d) Building was built and available for use on or after January 1, 1994.

I hereby certify that all existing plumbing fixtures are exempt pursuant to CA Civil Code Section 1101.7.
Print Name: _____ Date: _____
Signature: _____
Business Name (if applicable): _____ License Number _____
Please check one of the following, where applicable:
☐ Plumbing Contractor ☐ General Contractor ☐ Property Owner ☐ Owner's Agent ☐ Engineer ☐ Architect

Compliance: I hereby certify that existing plumbing fixtures, affected by Civil Code, Sections 1101.1-1101.8 do not exceed the water usage of noncompliant plumbing fixtures and that existing noncompliant plumbing fixtures have been replaced with water-conserving plumbing fixtures installed pursuant to applicable current California Codes.
Print Name: James Rice, El Segundo Public Works Date: _____
Signature: _____
Business Name (if applicable): City of El Segundo License Number _____
Please check one of the following, where applicable:
☐ Plumbing Contractor ☐ General Contractor ☒ Property Owner ☐ Owner's Agent ☐ Engineer ☐ Architect

18. Discontinue the application of any erodible landscape material within 2-days before a forecasted rain event or during periods of precipitation.

19. Apply erodible landscape material at quantities and application rates according to the manufacturer's recommendations or based on written specifications by knowledgeable and experienced field personnel.

20. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

21. Consider the quantity, physical characteristics (e.g. liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

22. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

23. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

24. Ensure effectiveness of BMP's to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

25. Control all non-storm water discharges during construction.

26. Wash all vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

27. Implement effective wind erosion control.

28. Provide effective soil cover for inactive areas and all finished slopes, open spaces, utility backfill, and completed lots.

29. Where plastic materials are deemed necessary. The Discharger shall consider the use of plastic materials resistant to solar degradation.

30. Maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

Good House keeping requirements

1. Conduct inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions, (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc…)

2. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc,).

3. Store Chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

4. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions, (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc…)

5. Implement BMP's to prevent the off-site tracking of loose construction and landscape materials.

6. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

7. Ensure the containment of sanitation facilities (e.g. portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

8. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

9. Cover waste disposal containers at the end of every business day and during a rain event.

10. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

11. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

12. Implement procedures that effectively address hazardous and non-hazardous spills. Have a procedure manual on the site.

13. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into underlying soil and the surrounding areas.

14. Prevent oil, grease, or fuel to leak into the ground, or storm drains.

15. Clean leaks immediately and dispose of leaked materials properly.

16. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

17. Contain fertilizers and other landscape materials when they are not actively being used.

Demolition

1. All demolition contracts require a lead and asbestos survey prior to permit issuance unless a declaration is provided for exemptions from the licensed contractor who is responsible for the work.
2. AQMD notification declaration is always required for all demolition projects regardless of exemption. See handout.
3. Manifest and closure letters of all abatement is required prior to the issuance of any building permit associated with demolition.

ASBESTOS NOTIFICATION

☐ Notification Letter sent to AQMD and/or EPA.

☐ I declare that notification of asbestos removal is not applicable to this project.

HAZARDOUS MATERIAL DECLARATION

Will the applicant or future building occupant handle a hazardous material or a mixture containing a hazardous material equal to or greater than the amount specified on the hazardous material information guide? (YES) (NO)

Will the intended use of the building by the applicant or future building occupant require a permit for construction or modification from the South Coast Air Quality Management District (SCAQMD)? See permitting checklist for guidelines. (YES) (NO)

I have read the hazardous materials information guide and the SCAQMD permitting checklist, I understand my requirements under the Los Angeles County Code Title 2, Chapter 220 Sections 220.1100 through 220.1403 concerning hazardous material reporting and for obtaining a permit from the SCAQMD.

FINAL DECLARATION

By my signature below, I certify to each of the following:
- I am the property owner or authorized to act on the property owner's behalf.
- I have read this application INCLUDING THE ABOVE DECLARATIONS and state that the information INCLUDING THE ABOVE DECLARATIONS is correct.
- I agree to comply with all applicable city and county ordinances and state laws relating to building construction.
- I authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.
- I understand that this permit is an application for inspection and that it does not approve or authorize the work specified herein, and it does not authorize or permit any violation or failure to comply with any applicable law. Furthermore, neither the City of El Segundo nor any board, department officer, or employee thereof, make any warranty, nor shall be responsible for the performance or results of any work described herein, nor the condition of the property on or the soil upon which such work is performed. I further affirm under penalty of perjury, that the proposed work will not destroy or unreasonably interfere with any access or utility easement belonging to others and located on my property, but in the event such work does destroy or unreasonably interfere with such easement, a substitute easement[s] satisfactory to the holder[s] of the easement will be provided.

Applicant's Signature: _____
Date: _____

ATTACHMENT A

BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES*

Storm Water Pollution Control Requirements for Construction Activities
Minimum Water Quality Protection Requirements for All Development Construction Projects/Certification Statement

The following is intended as minimum notes or as an attachment for building and grading plans and represent the minimum standards of good housekeeping that must be implemented on all construction sites regardless of size. (Applies to all permits)

- Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheetflow, swales, area drains, natural drainage courses or wind.
- Stockpiles of earth and other construction related materials must be protected from being transported from the site by the forces of wind or water.
- Fuels, oils, solvents and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil and surface waters. All approved storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
- Non-stormwater runoff from equipment and vehicle washing and any other activity shall be contained at the project site.
- Excess or waste concrete may not be washed into the public way or any other drainage system. Provisions shall be made to retain concrete wastes on site until they can be disposed of as solid waste.
- Trash and construction related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
- Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
- Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.
- Other: _____

As the project owner or authorized agent of the owner, I have read and understand the requirements listed above, necessary to control storm water pollution from sediments, erosion, and construction materials, and I certify that I will comply with these requirements.

Print Name James Rice
(Owner or authorized agent of the owner)

Signature _____ Date _____
(Owner or authorized agent of the owner)

*The above Best Management Practices are detailed in the California Storm Water Best Management Practices Handbook, January 2003. www.cabmphandbooks.com

Attachment A BMP Notes.doc

For the complete language of CA SB 407 (2009):
http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407&search_keywords

1101.2.
Except as provided in Section 1101.7, this article shall apply to residential and commercial real property built and available for use on or before January 1, 1994.
1101.3.
For the purposes of this article:
(a) "Commercial real property" means any real property that is improved with, or consisting of, a building that is intended for commercial use, including hotels and motels, that is not a single-family residential real property or a multifamily residential real property.
(b) "Multifamily residential real property" means any real property that is improved with, or consisting of, a building containing more than one unit that is intended for human habitation, or any mixed residential-commercial buildings or portions thereof that are intended for human habitation. Multifamily residential real property includes residential hotels but does not include hotels and motels that are not residential hotels.
(c) "Noncompliant plumbing fixture" means any of the following:
(1) Any toilet manufactured to use more than 1.6 gallons of water per flush.
(2) Any urinal manufactured to use more than one gallon of water per flush.
(3) Any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute.
(4) Any interior faucet that emits more than 2.2 gallons of water per minute.
(d) "Single-family residential real property" means any real property that is improved with, or consisting of, a building containing not more than one unit that is intended for human habitation.
(e) "Water-conserving plumbing fixture" means any fixture that is in compliance with current building standards applicable to a newly constructed real property of the same type.
(f) "Sale or transfer" means the sale or transfer of an entire real property estate or the fee interest in that real property estate and does not include the sale or transfer of a partial interest, including a leasehold.
1101.4.
(a) On and after January 1, 2014, for all building alterations or improvements to single-family residential real property, as a condition for issuance of a certificate of final completion and occupancy or final permit approval by the local building department, the permit applicant shall replace all noncompliant plumbing fixtures with water-conserving plumbing fixtures.
(b) On or before January 1, 2017, noncompliant plumbing fixtures in any single-family residential real property shall be replaced by the property owner with water-conserving plumbing fixtures.
(c) On and after January 1, 2017, a seller or transferor of single-family residential real property shall disclose in writing to the prospective purchaser or transferee the requirements of subdivision (b) and whether the real property includes any noncompliant plumbing fixtures.
1101.5.
(a) On or before January 1, 2019, all noncompliant plumbing fixtures in any multifamily residential real property and in any commercial real property shall be replaced with water-conserving plumbing fixtures.
(b) An owner or the owner's agent may enter the owner's property for the purpose of installing, repairing, testing, and maintaining water-conserving plumbing fixtures required by this section, consistent with notice requirements of Section 1954.
(c) On and after January 1, 2019, the water-conserving plumbing fixtures required by this section shall be operating at the manufacturer's rated water consumption at the time that the tenant takes possession. A tenant shall be responsible for notifying the owner or owner's agent if the tenant becomes aware that a water-conserving plumbing fixture within his or her unit is not operating at the manufacturer's rated water consumption. The owner or owner's agent shall correct an inoperability in a water-conserving plumbing fixture upon notice by the tenant or if detected by the owner or the owner's agent.
(d) (1) On and after January 1, 2014, all noncompliant plumbing fixtures in any multifamily residential real property and any commercial residential real property shall be replaced with water-conserving plumbing fixtures in the following circumstances:
(A) For building additions in which the sum of concurrent building permits by the same permit applicant would increase the floor area of the space in a building by more than 10 percent, the building permit applicant shall replace all noncompliant plumbing fixtures in the building.
(B) For building alterations or improvements in which the total construction cost estimated in the building permit is greater than one hundred fifty thousand dollars ($150,000), the building permit applicant shall replace all noncompliant plumbing fixtures that service the specific area of the improvement.
(C) Notwithstanding subparagraph (A) or (B), for any alterations or improvements to a room in a building that require a building permit and that room contains any noncompliant plumbing fixtures, the building permit applicant shall replace all noncompliant plumbing fixtures in that room.
(2) Replacement of all noncompliant plumbing fixtures with water-conserving plumbing fixtures, as described in paragraph (1), shall be a condition for issuance of a certificate of final completion and occupancy or final permit approval by the local building department.
(e) On and after January 1, 2019, a seller or transferor of multifamily residential real property or of commercial real property shall disclose to the prospective purchaser or transferee, in writing, the requirements of subdivision (a) and whether the property includes any noncompliant plumbing fixtures. This disclosure may be included in other transactional documents.
1101.6.
The duty of an owner or building permit applicant to comply with the requirements of this article shall be postponed for one year from the date of issuance of a demolition permit for the building. If the building is demolished within the one-year postponement, the requirements of this article shall not apply. If the building is not demolished after the expiration of one year, the provisions of this article shall apply, subject to appeal to the local building department, even though the demolition permit is still in effect or a new demolition permit has been issued.
1101.7.
This article shall not apply to any of the following:
(a) Registered historical sites.
(b) Real property for which a licensed plumber certifies that, due to the age or configuration of the property or its plumbing, installation of water-conserving plumbing fixtures is not technically feasible.
(c) A building for which water service is permanently disconnected.

KARDENT
ARCHITECTURE | DESIGN
11 Golden Shore, Suite 540 | Long Beach | CA 90802 | 562.436.9900

ARCHITECT:
LICENSED ARCHITECT GUSHOOH TAUFIK HO C-35088 March 31, 2027 Expires STATE OF CALIFORNIA
DATE SIGNED: 05/01/26

CONSULTANT:

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REVISIONS:

NO.:	DATE:	DESCRIPTION:
	05/01/26	PLAN CHECK
	06/16/26	BID SET

PLAN CHECK:
--

PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS
CENTER (EOC)

348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
BUILDING & SAFETY

SHEET NUMBER:
A-0.3

PROJECT:	SCALE:	DATE:
10389.17	AS NOTED	FEB 2026

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AIA California

2025 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 1

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC-CG] The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.

301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:

Note: On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

301.3.2 Waste Diversion. The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work.

301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBSC)
301.5 HEALTH FACILITIES. (see GBSC)

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

SECTION 303 PHASED PROJECTS

303.1 PHASED PROJECTS. For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

303.1.1 Initial Tenant improvements. The provisions of this code shall apply only to the initial tenant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations.

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

DIVISION 5.1 PLANNING AND DESIGN
SECTION 5.101 GENERAL

5.101.1 SCOPE
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 5.102 DEFINITIONS

5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

CUTOFF LUMINAIRES. Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

TENANT-OCCUPANTS. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

ZEV. [BSC-CG, DSA-SS] Any vehicle certified to zero-emission standards.

SECTION 5.105 DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES

5.105.1 Scope. [BSC-CG] Effective July 1, 2024, alteration(s) to existing building(s) where the combined altered floor area is 100,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 100,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3. Effective January 1, 2026, the combined floor area shall be 50,000 square feet or greater.

[DSA-SS] Alteration(s) to existing building(s) where the combined altered floor area is 50,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 50,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3.

Exception [BSC-CG, DSA-SS]: Combined addition(s) to existing building(s) of two times the area or more of the existing building(s) is not eligible to meet compliance with Section 5.105.2.

5.105.2 Reuse of existing building. An alteration or addition to an existing building shall maintain at a minimum 45 percent combined of the existing building's primary structural elements (foundations; columns, beams, walls, and floors; and lateral elements) and existing building enclosure (roof framing, wall framing and exterior finishes). Window assemblies, insulation, portions of buildings deemed structurally unsound or hazardous, and hazardous materials that are remediated as part of the project shall not be included in the calculation.

5.105.2.1 Verification of compliance. Documentation shall be provided in the construction documents to demonstrate compliance with Section 5.105.2.

Note: Sample Worksheet WS-3 in Chapter 8 may be used to assist in documenting compliance with this section.

5.105.3 Deconstruction (Reserved).

SECTION 5.106 SITE DEVELOPMENT

5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE ACRE OF LAND. Newly constructed projects and additions which disturb less than one acre of land, and are not part of a larger common plan of development or sale, shall prevent the pollution of storm water runoff from the construction activities through one or more of the following measures:

5.106.1.1 Local ordinance. Comply with a lawfully enacted storm water management and/or erosion control ordinance.

5.106.1.2 Best Management Practices (BMPs). Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMPs.

1. Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Scheduling construction activity during dry weather, when possible.
   b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMPs acceptable to the enforcing agency.
2. Good housekeeping BMPs to manage construction equipment, materials, non-stormwater discharges and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Dewatering activities.
   b. Material handling and waste management.
   c. Building materials stockpile management.
   d. Management of washout areas (concrete, paints, stucco, etc.).
   e. Control of vehicle/equipment fueling to contractor's staging area.
   f. Vehicle and equipment cleaning performed off site.
   g Spill prevention and control.
   h. Other housekeeping BMPs acceptable to the enforcing agency.

5.106.2 STORMWATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND. Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development sale.

Note: Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of the larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conversation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

5.106.4 BICYCLE PARKING. For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2

5.106.4.1 Bicycle parking. [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

5.106.4.1.1 Short-term bicycle parking. If the new project or an addition or alteration is anticipated to generate visitors, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 20% of the peak daily visitors, with a minimum of one two-bike capacity rack.

Exception: Additions or alterations which add nine or less visitor vehicular parking spaces.

5.106.4.1.2 Long-term bicycle parking. Acceptable bicycle parking facility for Section 5.106.4.1.2.1, 5.106.4.1.2.2 and 5.106.4.1.23 shall be conveniently located near the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3.Lockable, permanently anchored bicycle lockers.

Calculations for bicycle parking requirements shall be rounded up to the nearest whole number.

5.106.4.1.2.1
For new buildings with tenant spaces, provide secure bicycle parking for 10 percent of the tenant-occupants, with a minimum of one bicycle parking facility.

5.106.4.1.2.2
For additions or alternations, provide secure bicycle parking for 10 percent of the tenant-occupants being added, with a minimum of one bicycle parking facility.

5.106.4.1.2.3
For new shell buildings in phased projects, provide secure bicycle parking for 10 percent of the tenant-occupants, with a minimum of one bicycle parking facility.

5.106.4.2 Bicycle parking. [DSA-SS] For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2

5.106.4.2.1 Student bicycle parking. Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.
5.106.4.2.2 Staff bicycle parking. Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

5.106.5.3 Electric vehicle (EV) charging. [N] [BSC-CG] Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1 EV capable spaces, Section 5.106.5.3.2 Electric vehicle charging stations and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 Electric vehicle charging stations (EVCS)—Power allocation method and associated Table 5.106.5.3.6 and shall be provided in accordance with regulations in the *California Building Code* and the *California Electrical Code*.

Exceptions:
1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcement agency substantiating the local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.
2. Areas of parking facilities served by parking lifts, including but not limited to, automated mechanical-access open parking garages as defined in the California Building Code; or parking facilities otherwise incapable of supporting electric vehicle charging.

5.106.5.3.1 EV capable spaces. [N] EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:
1. Raceways complying with the California Electrical Code and no less that 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV capable and into a suitable listed cabinet, box,enclosure or equivalent. A common raceway may be used to serve multiple EV charging spaces.
2. A service panel or subpanel (s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.
4. The service panel or subpanel circuit directory shall identify the reserved overcurrent protective devices space(s) as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

Note: A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by an enforcement agency. See vehicle Code Section 22511.2 for further details.

TABLE 5.106.5.3.1 EV Capable Spaces and EVCS

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	OTHER THAN OFFICE AND RETAIL NUMBER OF REQUIRED ECVS[a2,3]	OFFICE AND RETAIL NUMBER OF REQUIRED ECVS[a2,3]
1-9	0	0	0
10-25	4	2	3
26-50	8	4	6
51-75	13	6	8
76-100	17	8	13
101-150	25	12	19
151-200	35	18	26
201 AND OVER	20 percent of actual parking spaces[1]	50 percent of EV capable spaces[1]	75 percent of EV capable spaces[1]

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. Each EVCS shall reduce the number of required capable spaces by the same number.
3. At least one Level 2 EVSE shall be provided.

5.106.5.3.2 Electric vehicle charging stations (EVCS) EV capable spaces shall be provided with electric vehicle supply equipment (EVSE) to create EVCS in the number indicated in Table 5.106.5.3.1. The EVCS required by Table 5.106.5.3.1 shall be provided with Level 2 EVSE or DCFC as permitted in Section 5.106.5.3.2.3. At least one Level 2 EVSE shall be provided.

One EV charger with multiple connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.3.1 for each EV capable space is accumulatively supplied to the EV charger.

5.106.5.3.2.1 Receptacle configurations. 208/240V EV charging receptacles shall comply with one of the following configurations:
1. For 20-ampere receptacles, NEMA 6-20R
2. For 30-ampere receptacles, NEMA 14-30R
3. For 50-ampere receptacles, NEMA 14-50R

5.106.5.3.2.2 EV charger connectors. EV chargers shall be equipped with SAE J1772 with a maximum output 240 Volts AC or SAE J3400 connectors.When using level 2 SAE J3400 SAE connectors, supplied by a 480 V 3-phase service, at least 20 percent of the EV charger connectors shall be SAE J1772 with a maximum output 240 Volts AC.

5.106.5.3.2.3 The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE or EVCS with Level 2 EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

5.106.5.3.2.4 The installation of two low power Level 2 EV charging receptacles shall be permitted to reduce the minimum number of required EV capable spaces without EVSE in Table 5.106.5.3.1 by one.

5.106.5.3.2.4.1 Raceway capacity requirements. To allow for future upgrades to the electrical conductors serving low power Level 2 charging receptacles, the listed raceway serving such receptacles shall be sized to allow the installation of a dedicated 208/240-volt 40-ampere branch circuit. Where no raceway is used, the conductors shall be sized to accommodate a 208/240-volt 40-ampere receptacle.

5.106.5.3.3 Use of automatic load management systems (ALMS).
ALMS shall be permitted for EVCS. When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.3.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.

5.106.5.3.4 Accessible EVCS.
When EVSE is installed, accessible EVSC shall be provided in accordance with the *California Building Code*, Chapter 11B, Section 11B-228.3.

Note: For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

5.106.5.3.4 Accessible electric vehicle charging station (EVCS). When EVSE is installed, accessible EVCS shall be provided in accordance with the *California Building Code*, Chapter 11B, Section 11B-228.3.

5.106.5.3.5 Electric vehicle charging station signage. Electric vehicle charging stations shall be identified by signage or pavement markings in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

Power allocation method shall include the following:
1. Use any kVA combination of EV capable spaces, low power Level 2, Level 2 or DCFC EVSEs.
2. At least one Level 2 EVSE shall be provided.

5.106.5.3.6 Electric vehicle charging stations (EVCS)—power allocation method. The power allocation method may be used as an alternative to the requirements in Section 5.106.5.3.1, Section 5.106.5.3.2 and associated Table 5.106.5.3.1. Use Table 5.106.5.3.6 to determine the total power in kVA required based on the total number of actual parking spaces.

TABLE 5.106.5.3.6 Power Allocation Method

TOTAL NUMBER OF ACTUAL PARKING SPACES	MINIMUM TOTAL kVA @ 6.6 kVA	OTHER THAN OFFICE AND RETAIL TOTAL kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE[2,4] LOW POWER LEVEL 2, LEVEL 2[1, 2] OR DCFC	OFFICE AND RETAIL TOTAL kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE[2,5] LOW POWER LEVEL 2, LEVEL 2[1, 2] OR DCFC
1-9	0	0	0
10-25	26.4	26.4	26.4
26-50	52.8	52.8	52.8
51-75	85.8	85.8	85.8
76-100	112.2	112.2	112.2
101-150	165	165	165
151-200	231	231	231
201 AND OVER	20 percent of actual parking spaces x 6.6	Total required kVA = P × .20 × 6.6 Where P = Parking spaces in facility	Total required kVA = P × .20 × 6.6 Where P = Parking spaces in facility

1. Level 2 EVSE @ 6.6 kVA minimum.
2. At least one Level 2 EVSE shall be provided.
3. Maximum allowed kVA to be utilized for EV capable spaces is 75 percent.
4. If EV capable spaces are utilized, they shall meet the requirements of Section 5.106.5.3.1 EV capable spaces.
5. For Office and Retail buildings the maximum allowed kVA to be utilized for EV capable is 25 percent.

5.106.5.3.6.1 Receptacle configurations. 208/240V EV charging receptacles shall comply with one of the following configurations:
1. For 20-ampere receptacles, NEMA 6-20R.
2. For 30-ampere receptacles, NEMA 14-30R.
3. For 50-ampere receptacles, NEMA 14-50R.

5.106.5.3.6.2 EV Charger connectors. EV chargers shall be equipped with SAE J1772 with a maximum output 240 Volts AC or SAE J3400 connectors. When using level 2 SAE J3400 connectors, supplied by a 480 V 3-phase service, at least 20 percent of the EV charger connectors shall be SAE J1772 with a maximum output 240 Volts AC.

5.106.5.3.6.3 Raceway capacity requirements. To allow for future upgrades to the electrical conductors serving low power Level 2 charging receptacles, the listed raceway serving such receptacles shall be sized to allow the installation of a dedicated 208/240-volt 40-ampere branch circuit. Where no raceway is used, the conductors shall be sized to accommodate a 208/240-volt 40-ampere receptacle.

5.106.5.4 Additions or alterations to existing buildings or parking facilities [A]. [BSC-CG] Existing buildings or parking facilities being modified by one of the following shall comply with Section 5.106.5.4.1 or 5.106.5.4.2. When EVSE is installed, accessible EVCS shall be provided in accordance with the *California Building Code*, Chapter 11B, Section 11B-228.3.

1. When the scope of construction work includes an increase in power supply to an electric service panel as part of a parking facility addition or alteration.
2. When a new photovoltaic system is installed covering existing parking spaces.
3. When additions or alterations to existing buildings are triggered pursuant to code Section 301.3 and the scope of work includes an increase in power supply to an electric service panel.

Exceptions:
1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply.
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcement agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.
   d. Where demonstrated as impracticable excluding local utility service or utility infrastructure issues.
2. Remote parking facilities that do not have access to the building service panel.
3. Parking area lighting upgrades where no trenching is part of the scope of work.
4. Emergency repairs, including but not limited to water line break in parking facilities, natural disaster repairs, etc.

5.106.5.4.1 Existing buildings or parking areas without previously installed EV capable infrastructure [A]. When EV capable infrastructure does not exist at an existing parking facility or building, and the parking facility or building undergoes an addition or alteration listed in Section 5.106.5.4, construction shall include electric vehicle charging in compliance with either Section 5.106.5.3 and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 and associated Table 5.106.5.3.6 for the total number of actual parking spaces being added or altered.

5.106.5.4.2 Existing buildings or parking areas with previously installed EV capable infrastructure [A]. When EV capable infrastructure is available at an existing parking facility or building, and the parking facility or building is undergoing an addition or alteration listed in Section 5.106.5.4, construction shall include electric vehicle charging in compliance with either Section 5.106.5.3 and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 and associated Table 5.106.5.3.6. Install EVCS at all existing EV capable spaces, utilizing the existing EV capable allocated power and infrastructure for the total number of actual parking spaces being added or altered, prior to adding any new EV capable spaces. If the area being added or altered exceeds the existing EV capable capacity, allocated power and infrastructure, provide additional EV charging as needed to comply with this section.

5.106.5.5 Electric vehicle (EV) charging: medium-duty and heavy-duty. [N] [BSC-CG] Construction shall comply with Section 5.106.5.5.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores, office buildings, and manufacturing facilities with planned off-street loading spaces shall also comply with Section 5.106.5.5.1 for future installation of medium- and heavy-duty EVSE.

Exceptions:
1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply.
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

5.106.5.5.1 Electric vehicle charging readiness requirements for warehouses, grocery stores, office buildings, and manufacturing facilities and retail stores with planned off-street loading spaces. [N]

In order to avoid future demolition when adding EV supply and distribution equipment, spare raceway(s) or busway(s) and adequate capacity for transformer(s), service panel(s) or subpanel(s) shall be installed at the time of construction in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The transformer, main service equipment and subpanels shall meet the minimum power requirement in Table 5.106.5.5.1 to accommodate the dedicated branch circuits for the future installation of EVSE.

2. The construction documents shall indicate one or more location(s) convenient to the planned off-street loading space(s) reserved for medium- and heavy-duty ZEV charging cabinets and charging dispensers, and a pathway reserved for routing of conduit from the termination of the raceway(s) or busway(s) to the charging cabinet(s) and dispenser(s), as shown in Table 5.106.5.5.1.

3. Raceway(s) or busway(s) originating at a main service panel or a subpanel(s) serving the area where potential future medium- and heavy-duty EVSE will be located and shall terminate in close proximity to the potential future location of the charging equipment for medium- and heavy-duty vehicles.

4. The raceway(s) or busway(s) shall be of sufficient size to carry the minimum additional system load to the future location of the charging for medium- and heavy-duty ZEVs as shown in Table 5.106.5.5.1.

TABLE 5.106.5.5.1 RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]

BUILDING TYPE	BUILDING SIZE (SQ. FT.)	NUMBER OF OFF-STREET LOADING SPACES	ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY & BUSWAY AND TRANSFORMER & PANEL
Grocery	10,000 to 90,000	1 or 2	200
		3 or Greater	400
	Greater than 90,000	1 or Greater	400
Manufacturing Facilities	10,000 to 50,000	1 or 2	200
	10,000 to 50,000	3 or Greater	400
	Greater than 50,000	1 or Greater	400
Office Buildings	10,000 to 135,000	1 or 2	200
	10,000 to 135,000	3 or Greater	400
	Greater than 135,000	1 or Greater	400
Retail	10,000 to 135,000	1 or 2	200
		3 or Greater	400
	Greater than 135,000	1 or Greater	400
Warehouse	20,000 to 256,000	1 or 2	200
		3 or Greater	400
	Greater than 256,000	1 or Greater	400

5.106.5.6 Electric vehicle (EV) charging at public schools and community colleges. [DSA-SS] Electric vehicle infrastructure and electric vehicle charging stations shall comply with Section 5.106.5.6 and shall be provided in accordance with regulations in the California Building Code and the California Electrical Code.

Exceptions:
1. On a case-by-case basis where compliance with this section has been demonstrated to be not feasible based upon one of the following conditions,and with concurrence by the Division of the State Architect (DSA), compliance with Section 5.106.5.6 shall not be required.
   a. Where there is no local utility power supply.
   b. Where the local utility is unable to supply adequate power.
   c. The installation of EVCS is impracticable.
2. Parking spaces accessible only by automated mechanical car parking systems are not required to comply with Section 5.106.5.6.

5.106.5.6.1 EV capable spaces. EV capable spaces shall be provided in accordance with Table 5.106.5.6.1 and the following requirements:

1. Raceways complying with the California Electrical Code and no less than 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area and shall terminate in close proximity to the proposed location of the EV capable space and into a suitable listed cabinet, box, enclosure or equivalent. A common raceway may be used to serve multiple EV capable spaces.

2. A service panel or subpanel(s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.

3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.

4. The service panel or subpanel circuit directory shall identify the reserved overcurrent protective device space(s) as "EV CAPABLE." The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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	05/01/26	PLAN CHECK
	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS
CENTER (EOC)

348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY: -
CHECKED BY: MQ

SHEET TITLE:
CALGREEN

SHEET NUMBER:
A-0.4

PROJECT: 10389.17
SCALE: AS NOTED
DATE: FEB 2026

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PLAN CHECK NUMBER 348 MAIN ST, EL SEGUNDO, CA 90245

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2025 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 2

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

TABLE 5.106.5.6.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF REQUIRED EVCS[2]
0-9	0	0
10-25	4	1
26-50	8	2
51-75	13	3
76-100	17	4
101-150	25	6
151-200	35	9
201 AND OVER	20 percent of total spaces[1]	25 percent of EV capable spaces[1]

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. Each EVCS shall reduce the number of required EV capable spaces by the same number.

5.106.5.6.2 Electric vehicle charging stations (EVCS). EV capable spaces shall be provided with EVSE to create EVCS in the number indicated in Table 5.106.5.6.1 and shall comply with Section 5.106.5.6.2. EVCS shall be serviced by Level 2 or Direct Current Fast Charging (DCFC) EVSE, or with EVSE in any combination of Level 2 and DCFC. Accessible EVCS shall be provided in accordance with *California Building Code* Chapter 11B.

5.106.5.6.2.1 Reduced number of EV capable spaces. The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces indicated in Table 5.106.5.6.1 by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

5.106.5.6.2.2 Multiple connectors. EVSE with multiple vehicle connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.6.1 for each EV capable space is accumulatively supplied to the EVSE.

5.106.5.6.2.3 Use of automatic load management systems (ALMS). ALMS shall be permitted for EVCS installed in accordance with Section 5.105.5.6.2. When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.6.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.

5.106.5.6.3 EVCS alternative compliance. In lieu of compliance with Section 5.106.5.6.2, EVCS shall be provided with Level 1, low power Level 2, or Level 2, or any combination of Level 1, low power Level 2 or Level 2 EVSE such that the total power supplied by the combination of EVSE meets the minimum power indicated in Table 5.106.5.6.3, based on the total number of actual parking spaces in each parking facility.

TABLE 5.106.5.6.3

NUMBER OF PARKING SPACES IN A PARKING FACILITY	MINIMUM TOTAL POWER (KVA) REQUIRED FOR EVCS
0-9	0
10-25	7
26-50	14
51-75	20
76-100	27
101-150	40
151-200	60
201 AND OVER	Total required KVA = P × .05 × 6.6 Where P = Parking spaces in facility

5.106.5.6.4 EVCS for alterations of or additions to parking facilities. Alterations of or additions to parking facilities shall provide EVCS in compliance with Section 5.106.5.6.4. The installation of infrastructure for EV capable spaces required to be provided without EVSE shall not be required.

5.106.5.6.4.1 Alterations of and additions to parking facilities. EVCS shall be provided in accordance with the number indicated in Table 5.106.5.6.1 or minimum power indicated in Table 5.106.5.6.3 when the scope of work includes an increase in power supply to an electric panel serving light fixtures illuminating the parking area or when area containing parking spaces is added to a parking facility. The number of required EVCS shall be based on the total number of existing and new parking spaces in the parking facility.

5.106.5.6.4.2 Alterations consisting of the installation of photovoltaic systems. EVCS shall be provided in accordance with the number indicated in Table 5.106.5.6.1 or maximum power indicated in Table 5.106.5.6.3 when a new photovoltaic system is installed in an existing parking facility.

5.106.5.6.5 Requirement to install EVSE. Level 2 EVSE shall be provided in all existing EV capable spaces to create EVCS when a project is required by California Administrative Code Section 4-309 to be submitted for plan approval to the Division of the State Architect. When EVSE is installed in existing EV capable spaces, accessible EVCS shall be provided in accordance with *California Building Code* Chapter 11B.

Exception: Projects in which improvements in parking areas consist only of accessibility improvements are not required to comply with Section 5.106.5.6.5.

5.106.8 LIGHT POLLUTION REDUCTION. [N]. I Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);
3. Uplight and Glare ratings as defined in California Energy Code (shown in Tables 130.2-A and 130.2-B in Chapter 8) and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8, [N] or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: [N]

1. Luminaires that qualify as exceptions in Sections 130.2 (b) and 140.7 of the California Energy Code.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.
5. Luminaires with less than 6,200 initial luminaire lumens.

TABLE 5.106.8 [N] MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS 1,2

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
MAXIMUM ALLOWABLE BACKLIGHT RATING 3					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1-2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5-1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
MAXIMUM ALLOWABLE UPLIGHT RATING (U)					
For area lighting 3	N/A	U0	U0	U0	U0
For all other outdoor lighting,including decorative luminaires	N/A	U1	U2	U3	UR
MAXIMUM ALLOWABLE GLARE RATING 3 (G)					
MAXIMUM ALLOWABLE GLARE RATING 3 (G)	N/A	G1	G2	G3	G4
MAXIMUM ALLOWABLE GLARE RATING 3 (G)	N/A	G0	G1	G1	G2
MAXIMUM ALLOWABLE GLARE RATING 3 (G)	N/A	G0	G0	G1	G1
MAXIMUM ALLOWABLE GLARE RATING 3 (G)	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaries located in these areas shall meet *U*-value limits for "all other outdoor lighting"

5.106.8.1 Facing- Backlight
Luminaries within 2MH of a property line shall be oriented so that the nearest property line is behind the fixture, and shall comply with the backlight rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point of that property line.

Exception: Corners. If two property lines (or two segments of the same property line) have equidistant point to the luminaire, then the luminaire may be oriented so that the intersection of the two lines (the corner) is directly behind the luminaire. The luminaire shall still use the distance to the nearest points(s) on the property lines to determine the required backlight rating.

5.106.8.2 Facing-Glare.
For luminaires covered by 5.106.8.1, if a property line also exists within or extends into the front hemisphere within 2MH of the luminaire then the luminaire shall comply with the more stringent glare rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point on the nearest property line within the front hemisphere.

Note: [N]
1.See also *California Building Code*, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.
2.Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A-1, *California Energy Code* Tables 130.2-A and 130.2-B.
3. Refer to the *California Building Code* for requirements for additions and alterations.

5.106.10 GRADING AND PAVING. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.
   Exception: Additions and alterations not altering the drainage path.

5.106.12 SHADE TREES [DSA-SS]. Shade Trees shall be planted to comply with Sections 5.106.12.1, 5.106.12.2, and 5.106.12.3. Percentages shown shall be measured at noon on the summer solstice. Landscape irrigation necessary to establish and maintain tree health shall comply with Section 5.304.6.

5.106.12.1 Surface parking areas. Shade tree plantings, minimum #10 container size or equal, shall be installed to provide shade over 50 percent of the parking area within 15 years.

Exceptions: Surface parking area covered by solar photovoltaic shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.

5.106.12.2 Landscape areas. Shade tress plantings, minimum #10 container size or equal shall be installed to provide shade of 20% of the landscape area within 15 years.

Exceptions: Playfields for organized sport activity are not included in the total area calculation.

5.106.12.3. Hardscape areas. Shade tree plantings, minimum #10 container size or equal shall be installed to provide shade over 20 percent of the hardscape area within 15 years.

Exceptions:
1. Walks, hardscape areas covered by solar photovoltaic shade structures or shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.
2. Designated and marked play areas of organized sport activity are not included in the total area calculation.

DIVISION 5.2 ENERGY EFFICIENCY

SECTION 5.201 GENERAL

5.201.1 Scope [BSC-CG]. *California Energy Code [DSA-SS].* For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

DIVISION 5.3 WATER EFFICIENCY AND CONSERVATION

SECTION 5.301 GENERAL

5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water use indoors, outdoors and in wastewater conveyance.

SECTION 5.302 DEFINITIONS

5.302.1 Definitions. The following terms are defined in Chapter 2 *(and are included here for reference)*

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS]. An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which ae two major influences on the amount of water that needs to be applied to the landscape.

FOOTPRINT AREA [DSA-SS]. The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

METERING FAUCET. A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

GRAYWATER. Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs, but does not include waste water from kitchen sinks or dishwashers.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD] The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

POTABLE WATER. Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the California Plumbing Code, Part 5.

POTABLE WATER. [HCD] Water that is satisfactory for drinking, culinary, and domestic purposes, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

SPECIAL LANDSCAPE AREA (SLA). [DSA-SS] An area of the landscape dedicated solely to edible plants, planting areas used for educational purposes, recreational areas, areas irrigated with recycled water, water features using recycled water, and where turf provides a playing surface or gathering space.

SUBMETER. [HCD 1] A secondary device beyond a meter that measures water consumption of an individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure. (See Civic Code Section 1954.202 (g) and Water code Section 517 for additional details.)

SECTION 5.303 INDOOR WATER USE

5.303.1 METERS. Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

5.303.3.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

5.303.3.2 Urinals.
5.303.3.2.1 Wall-mounted Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.

5.303.3.2.2 Floor-mounted Urinals. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.

5.303.3.3 Showerheads. [BSC-CG]
5.303.3.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.
Note: A hand-held shower shall be considered a showerhead.

5.303.3.4 Faucets and fountains.
5.303.3.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

5.303.3.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

5.303.3.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of not more than1.8 gallons per minute/20 [rim space (inches) at 60 psi].

5.303.3.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle.

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

5.303.3.4.6 Pre-rinse spray value
When installed, commercial pre-rinse spray valves shall meet the requirements in the California Plumbing Code, Section 420.3.

5.303.4 COMMERCIAL KITCHEN EQUIPMENT.

5.303.4.1 Food Waste Disposers. Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.
Note: This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

5.303.5 AREAS OF ADDITION OR ALTERATION. For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

SECTION 5.304 OUTDOOR WATER USE

5.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

Notes:
1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.
2. MWELO and supporting documents, including a water budget calculator, are available at: https://www.water.ca.gov/.

5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

5.304.6.1 Newly constructed landscapes. New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

5.304.6.2 Rehabilitated landscapes. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401 GENERAL

5.401.1 SCOPE. The provisions of this chapter specify the requirements of achieving material conservation, resource efficiency, and greenhouse gas (GHG) emission reduction through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, the installation of products with lower GHG emissions and building commissioning or testing and adjusting.

SECTION 5.402 DEFINITIONS

5.402.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ADJUST. To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

BALANCE. To proportion flows within the distribution system, including sub-mains, branches and terminals, according to design quantities.

BUILDING COMMISSIONING. A systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

BUY CLEAN CALIFORNIA ACT (BCCA). The Buy Clean California Act (BCCA) (Public Contract Code Sections 3500-3505) targets carbon emissions associated with the production of structural steel (hot-rolled sections, hollow structural sections, and plate), concrete reinforcing steel, flat glass, and mineral wool board insulation. The maximum acceptable global warming potential (GWP) limits are established by the Department of General Services (DGS), in consultation with the California Air Resources Board (CARB).

CRADLE-TO-GRAVE. Activities associated with a product or building's life cycle from the extraction stage through disposal stage, and covering modules A1 through C4 in accordance with ISO Standards 14025 and 21930.

ORGANIC WASTE. Food waste, green waste, landscape and pruning wste, nonhazardous wood waste, and food soiled paper waste that is mixed in with food waste.

REFERENCE STUDY PERIOD. The period of use for the building, in years, that will be assumed for life cycle assessment.

TEST. A procedure to determine quantitative performance of a system or equipment

TYPE III ENVIRONMENTAL PRODUCT DECLARATION (EPD). A third-party verified report that summarizes how a product impacts the environment. Type III EPDs can be either product-specific, factory-specific, or industry-wide EPDs. See "Cradle-to-Gate."

FACTORY-SPECIFIC EPD. A product-specific Type III EPD in which the environmental impacts can be attributed to a single manufacturer and manufacturing facility.

INDUSTRY-WIDE EPD (IW-EPD). A Type III EPD in which the environmental impacts are an average of the typical manufacturing impacts for a range of products within the same product category for a group of manufacturers.

PRODUCT-SPECIFIC EPD. A Type III EPD in which the environmental impacts can be attributed to a product design and manufacturer across multiple facilities.

SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

5.407.1 WEATHER PROTECTION. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1402.2 (Weather Protection), manufacturer's installation instructions or local ordinance, whichever is more stringent.

5.407.2 MOISTURE CONTROL. Employ moisture control measures by the following methods.

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent spray on structures.

5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

5.407.2.2 Flashing. Install flashings integrated with a drainage plane.

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

5.408.1.2 Waste Management Company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65% minimum requirement as approved by the enforcing agency.

5.408.1.4 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Notes:
1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

5.408.2 UNIVERSAL WASTE. [A] Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/universalwaste/

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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DATE SIGNED: 05/01/26

CONSULTANT:

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NO.:	DATE:	DESCRIPTION:
	05/01/26	PLAN CHECK
	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS CENTER (EOC)
348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
CALGREEN

SHEET NUMBER:
A-0.5

PROJECT:	SCALE:	DATE:
10389.17	AS NOTED	FEB 2026

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PLAN CHECK NUMBER 348 MAIN ST, EL SEGUNDO, CA 90245

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2025 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 3

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

Exception: Reuse, either on or off-site, of vegetation or soil contaminated by disease or pest infestation.

Notes:
1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material.
2. For a map of know pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

SECTION 5.409 LIFE CYCLE ASSESSMENT

5.409.1 SCOPE. [BSC-CG] Effective July 1, 2024, projects consisting of newly constructed building(s) with a combined floor area of 100,000 square feet or greater shall comply with either Section 5.409.2 or Section 5.409.3. Alteration(s) to existing building(s) where the combined altered floor area is 100,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 100,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3. Effective January 1, 2026, the combined floor area shall be 50,000 square feet or greater.

[DSA-SS] Projects consisting of newly constructed building(s) with a combined floor area of 50,000 square feet or greater shall comply with either Section 5.409.2 or Section 5.409.3. Alteration(s) to existing building(s) where the combined altered floor area is 50,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 50,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3.

5.409.2 Whole building life cycle assessment. Projects shall conduct a cradle-to-grave whole building life cycle assessment performed in accordance with ISO 14040 and ISO 14044, excluding operating energy, and demonstrating a minimum 10-percent reduction in global warming potential (GWP) as compared to a reference baseline building of similar size, function, complexity, type of construction, material specification, and location that meets the requirements of the California Energy Code currently in effect. Software used to conduct the whole building life cycle assessment, including reference baseline building, shall have a data set compliant with ISO 14044, and ISO 21930 or EN 15804, and the software shall conform to ISO 21931 and/or EN 15978. The software tools and data sets shall be the same for evaluation of both the baseline building and the proposed building.

Notes:
1. Software for calculating whole building life cycle assessment is available for free at Athena Sustainable Materials Institute (https://calculatelca.com/software/impact-estimator/) and OneClick LCA-Planetary (www.oneclicklca.com/planetary). Paid versions include, but are not limited to, Sphera GaBi Solutions (gabi.sphera.com), SimaPro (simapro.com), One-Click LCA (www.oneclicklca.com) and Tally for Revit (apps.autodesk.com).

2. ASTM E2921-22 "Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems" may be consulted for the assessment.

3. In addition to the required documentation specified in Section 5.409.2.3, Worksheet WS-9 may be required by the enforcing entity to demonstrate compliance with the requirements.

5.409.2.1 Building components. Building enclosure components included in the assessment shall be limited to glazing assemblies, insulation, and exterior finishes. Primary and secondary structural members included in the assessment shall be limited to footings and foundations, and structural columns, beams, walls, roofs, and floors.

5.409.2.2 Reference study period. The reference study period of the proposed building shall be equal to the reference baseline building and shall be 60 years.

5.409.2.3 Verification of compliance. A summary of the GWP analysis produced by the software and Worksheet WS-4 signed by the design professional of record shall be provided in the construction documents as documentation of compliance. A copy of the whole building life cycle assessment which includes the GWP analysis produced by the software, in addition to maintenance and training information, shall be included in the operation and maintenance manual and shall be provided to the owner at the close of construction. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

5.409.3 Product GWP compliance—prescriptive path. Each product that is permanently installed and listed in Table 5.409.3 shall have a Type III environmental product declaration (EPD), either product-specific or factory-specific.

TABLE 5.409.3
PRODUCT GWP LIMITS

BUY CLEAN CALIFORNIA MATERIALS PRODUCT CATEGORY[1]	MAXIMUM ACCEPTABLE GWP VALUE (unfabricated) ($GWP_{allowed}$)	UNIT OF MEASUREMENT
Hot-rolled structural steel sections	1.77	MT CO_2e/MT
Hollow structural sections	3.00	MT CO_2e/MT
Steel plate	2.61	MT CO_2e/MT
Concrete reinforcing steel	1.56	MT CO_2e/MT
Flat glass	2.50	kg CO_2e/MT
Light-density mineral wool board insulation	5.83	kg CO_2e/MT
Heavy-density mineral wool board insulation	14.28	kg CO_2e/MT
Concrete, Ready-Mixed[2, 3]		
CONCRETE PRODUCT CATEGORY	**MAXIMUM GWP ALLOWED VALUE ($GWP_{allowed}$)**	**UNIT OF MEASUREMENT**
up to 2499 psi	450	kg CO_2e/m^3
2500~3499 psi	489	kg CO_2e/m^3
3500~4499 psi	566	kg CO_2e/m^3
4500~5499 psi	661	kg CO_2e/m^3
5500~6499 psi	701	kg CO_2e/m^3
6500 psi and greater	799	kg CO_2e/m^3
Concrete, Lightweight Ready-Mixed[2]		
CONCRETE PRODUCT CATEGORY	**MAXIMUM GWP ALLOWED VALUE ($GWP_{allowed}$)**	**UNIT OF MEASUREMENT**
up to 2499 psi	875	kg CO_2e/m^3
2500~3499 psi	956	kg CO_2e/m^3
3500~4499 psi	1039	kg CO_2e/m^3

1. The GWP values of the products listed in Table 5.409.3 are based on 175 percent of Buy Clean California Act (BCCA) GWP values, except for concrete products which are not included in the BCCA.
2. For concrete, 175 percent of the National Ready Mixed Concrete Association (NRMCA) 2022 version 3 Pacific Southwest regional benchmark values are used for the GWP allowed, except for High Early Strength.
3. Concrete High Early Strength ready-mixed shall be calculated at 130 percent of the ready-mixed concrete GWP allowed values for each product category.

5.409.3.1 Products shall not exceed the maximum GWP value specified in Table 5.409.3.

Exception: Concrete may be considered one product category to meet compliance with this section. A weighted average of the maximum GWP for all concrete mixes installed in the project shall be less than the weighted average maximum GWP allowed per Table 5.409.3 using Exception Equation 5.409.3.1. Calculations shall be performed with consistent units of measurement for the material quantity and the GWP value.

For the purposes of this exception, industry-wide EPDs are acceptable.

Exception EQUATION 5.409.3.1

$GWP_S < GWP_{allowed}$
where
$GWP_S = \Sigma\ (GWP_n)(V_n)$
and
$GWP_{allowed} = \Sigma\ (GWP_{allowed})(V_n)$
and
$_n$ = each concrete mix installed in the project
GWP_n = the GWP for concrete mix $_n$ per concrete mix EPD, in kg CO2e/m3
$GWP_{allowed}$ = the GWP potential allowed for concrete mix $_n$ per Table 5.409.3
V_n = the volume of concrete mix $_n$ installed in the project, in m3

5.409.3.2 Verification of compliance. Calculations to demonstrate compliance, Type III EPDs for products required to comply, if included in the project, and Worksheet WS-5 signed by the design professional of record shall be provided on the construction documents. Updated EPDs for products used in construction shall be provided to the owner at the close of construction and to the enforcement entity upon request. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS

5.410.1 RECYCLING BY OCCUPANTS. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30% or more in floor area, shall provide recycling areas on site.

Exception: Additions within a tenant space resulting in less than a 30% increase in the tenant space floor area.

5.410.1.2 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

Note: A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

5.410.2 COMMISSIONING. [N] New buildings 10,000 square feet and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated y the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements

Commissioning requirements shall include:

1. Owner's or Owner representative's project requirements.
2. Basis of Design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area or room which does not provide heating and/or air conditioning.

Informational Notes:

1. . Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

5.410.2.1 Owner's or Owner Representative's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:
1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse system.

5.410.2.3 Commissioning plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:
1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests.
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

5.410.2.4 Functional performance testing. [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

5.410.2.5 Documentation and training. [N] A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:
1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:
1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the Systems Manual.
4. Review of the record drawings on the system/equipment.

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

5.410.4 TESTING AND ADJUSTING. New buildings less than 10,000 square feet. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.2 (Reserved)

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O & M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.

DIVISION 5.5 ENVIRONMENTAL QUALITY

SECTION 5.501 GENERAL

5.501.1 SCOPE. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 5.502 DEFINITIONS

5.502.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ARTERIAL HIGHWAY. A general term denoting a highway primarily for through traffic usually on a continuous route.

A-WEIGHTED SOUND LEVEL (dBA). The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

1 BTU/HOUR. British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32° Fahrenheit.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL). A metric similar to the day-night average sound level (Ldn), except that a 5 decibel adjustment is added to the equivalent continuous sound exposure level for evening hours (7pm to 10pm) in addition to the 10 dB nighttime adjustment used in the Ldn.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, timber, prefabricated wood I–joists or finger–jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

Note: See CCR, Title 17, Section 93120.1.

DAY-NIGHT AVERAGE SOUND LEVEL (Ldn). The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10p.m. to 7 a.m.).

DECIBEL (db). A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

EXPRESSWAY. An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

FREEWAY. A divided arterial highway with full control of access and with grade separations at intersections.

GLOBAL WARMING POTENTIAL (GWP). The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE). A 100-year GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column "SAR (100-yr)" of Table 2.14.; the AR4 GWP values are found in column "100 yr" of Table 2.14.

HIGH-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that is: (a) a chlorofluorocarbon, a hdrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

LONG RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

LOW-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2–1999.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base REactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram (g O^3/g ROC).

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

PSIG. Pounds per square inch, guage.

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

SCHRADER ACCESS VALVES. Access fittings with a valve core installed.

SHORT RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

SUPERMARKET. For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

VOC. A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).

Note: Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 5.503 FIREPLACES

5.503.1 FIREPLACES. Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

5.503.1.1 Woodstoves. Woodstoves and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

SECTION 5.504 POLLUTANT CONTROL

5.504.1 TEMPORARY VENTILATION. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilation equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

5.504.4 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:
1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, *of California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]
Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT
Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NONPOROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

DISCLAIMER: THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.

KARDENT
ARCHITECTURE | DESIGN
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ARCHITECT:
LICENSED ARCHITECT GREGORY TAUSSIG C-35088 March 31, 2027 STATE OF CALIFORNIA
DATE SIGNED: 05/01/26
CONSULTANT:

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REVISIONS:

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	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS CENTER (EOC)
348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
CALGREEN

SHEET NUMBER:
A-0.6

PROJECT:	SCALE:	DATE:
10389.17	AS NOTED	FEB 2026

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PLAN CHECK NUMBER 348 MAIN ST, EL SEGUNDO, CA 90245

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2025 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 4

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY
☐	☐	

5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

5.504.4.3.1 Aerosol Paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

TABLE 5.504.4.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	CURRENT VOC LIMIT
FLAT COATINGS	50
NONFLAT COATINGS	100
NONFLAT HIGH GLOSS COATINGS	150
SPECIALTY COATINGS:	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH-TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS
2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.
3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:
1. Manufacturer's product specification
2. Field verification of on-site product containers

5.504.4.4 Carpet Systems.
All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,"Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.

5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:
1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.
2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

5.504.4.6 Resilient flooring systems. Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specifications 01350)

See California Department of Public Health's website for certification programs and testing labs. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.6.1 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

5.504.4.7 Thermal insulation
Comply with the requirements of the California Department of Public Health, "Standard Method of the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, "Version 1.2, January 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.7.1 Verification of compliance.
Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.

5.504.4.8 Acoustical ceiling and wall panels.
Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, " Version 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs.

5.504.4.8.1 Verification of compliance. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.

5.504.5 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

Exceptions: Existing mechanical equipment.

5.504.5.1 Labeling. Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of this code.

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 CARBON DIOXIDE (CO_2) MONITORING. For buildings or additions equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120(c)(4).

5.506.3 Carbon dioxide (CO2) monitoring in classrooms.
[DSA-SS] Classrooms and other similar rooms that are used for group instruction shall be equipped with a carbon dioxide monitor or sensor.

[BSC-CG] Newly constructed projects and qualifying additions and alterations (per scope in Section 301.3) for University of California, California State University and private school classrooms, lecture and post-secondary classrooms shall be equipped with a carbon dioxide monitor or sensor.

[DSA-SS, BSC-CG] The carbon dioxide monitor or sensor shall meet the following requirements:
1. The monitor or sensor shall be permanently affixed in a tamper-proof manner in each classroom between 3 and 6 feet (914 mm and 1829 mm) above the floor and at least 5 feet (1524 mm) away from door and operable windows.
2. When the monitor or sensor is not integral to an Energy Management Control System (EMCS), the monitor or sensor shall display the carbon dioxide readings on the device. When the sensor is integral to an EMCS, the carbon dioxide readings shall be available to and regularly monitored by facility personnel.
3. A monitor shall provide notification though a visual indicator on the monitor when the carbon dioxide levels in the classroom have exceeded 1,100ppm. A sensor integral to an EMCS shall provide notification to facility personnel through a visual and/or audible indicator when the carbon dioxide levels in the classroom have exceed 1,100ppm.
4. The monitor or EMCS devices used to measure carbon dioxide levels shall maintain a record of previous data that includes at least the maximum carbon dioxide concentration measured.
5. The monitor or sensor used to measure carbon dioxide levels shall have the capacity to measure carbon dioxide levels with a range of 400ppm to 2000ppm or greater.
6. The monitor or sensor shall be certified by the manufacturer to be accurate within 75ppm at 1,000ppm carbon dioxide concentration and shall be certified by the manufacturer to require calibration no more frequently than once every 5 years.

SECTION 5.507 ENVIRONMENTAL COMFORT

5.507.4 ACOUSTICAL CONTROL. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413, or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1. Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq} - 1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance Method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site Features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of Compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.

5.508.2.1 Refrigerant piping. Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack.

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

5.508.2.1.2.1 Anchorage. One-fouth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

5.508.2.1.3 Flared tubing connections. Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2 Valves. Valves Valves and fittings shall comply with the *California Mechanical Code* and as follows.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.2 Access valves. Only Schrader access valves with a brass or steel body are permitted for use.

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

5.508.2.2.2.2 Seal caps. If designed for it, the cap shall have a neoprene O-ring in place.

5.508.2.2.2.2.1 Chain tethers. Chain tethers to fit ovr the stem are required for valves designed to have seal caps.

Exception: Valves with seal caps that are not removed from the valve during stem operation.

5.508.2.3 Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

5.508.2.4 Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device tha indicates the level of refrigerant in the receiver.

5.508.2.5 Pressure testing. The system shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

702 QUALIFICATIONS

702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

[BSC-CG] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS

703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

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GORDON TAUSSIG
C-35088
March 31, 2027
STATE OF CALIFORNIA
DATE SIGNED: 05/01/26

CONSULTANT:

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SCALE: AS NOTED
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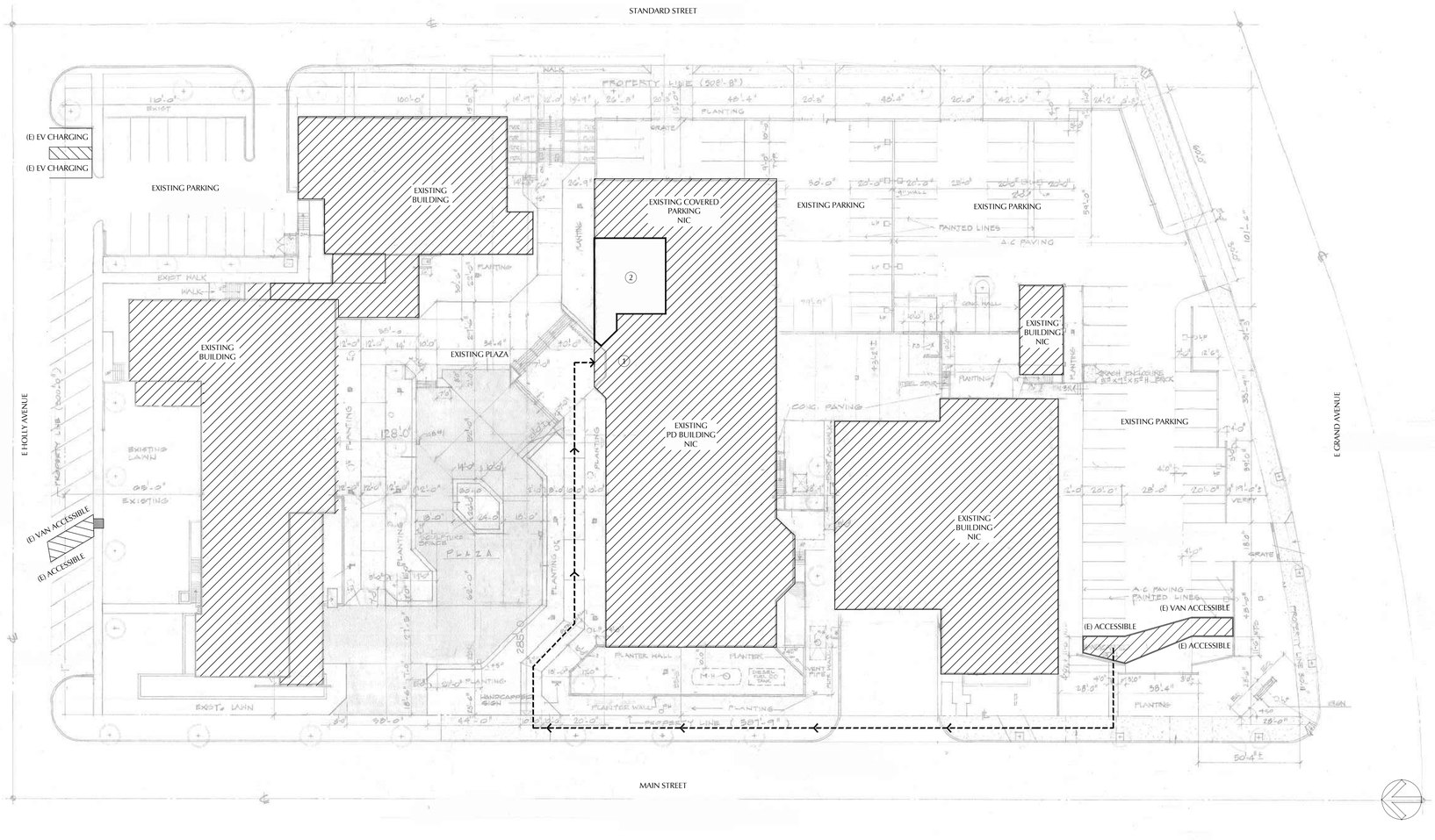


SITE PLAN GENERAL NOTES

"ACCESSIBLE ROUTE" IS DEFINED AS A CONTINUOUS UNOBSTRUCTED PATH CONNECTING ACCESSIBLE ELEMENTS AND SPACES OF AN ACCESSIBLE SITE, BUILDING OR FACILITY THAT CAN BE NEGOTIATED BY A PERSON WITH DISABILITY USING A WHEELCHAIR, AND THAT IS ALSO SAFE FOR AND USABLE BY PERSONS WITH OTHER DISABILITIES.

11B-206 ACCESSIBLE ROUTES
AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES AND ACCESSIBLE PASSENGER LOADING ZONES; PUBLIC STREETS AND SIDEWALKS; AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY ENTRANCE THEY SERVE. *WHERE MORE THAN ONE ROUTE IS PROVIDED, ALL ROUTES MUST BE ACCESSIBLE.*

AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES THAT ARE ONE THE SAME SITE.

AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT EACH STORY AND MEZZANINE IN MULTI-STORY BUILDINGS AND FACILITIES.

AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH ALL ACCESSIBLE SPACES AND ELEMENTS WITHIN THE BUILDING OR FACILITY, *INCLUDING MEZZANINES*, WHICH ARE OTHERWISE CONNECTED BY A CIRCULATION PATH UNLESS EXEMPTED BY SECTION 11B-206.2.3

ENTRANCES SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 11B-206.4. ENTRANCE DOORS, DOORWAYS, GATES SHALL COMPLY WITH SECTION 11B-404 AND SHALL BE ON AN ACCESSIBLE ROUTE COMPLYING WITH SECTION 11B-402.

11B-208 PARKING SPACES
WHERE MORE THAN ONE PARKING FACILITY IS PROVIDED ON A SITE, THE NUMBER OF ACCESSIBLE SPACES PROVIDED ON THE SITE SHALL BE CALCULATED ACCORDING TO THE NUMBER OF SPACES REQUIRED FOR EACH PARKING FACILITY

FOR EVERY SIX OR FRACTION OF SIX PARKING SPACES REQUIRED BY SECTION 11B-208.2 TO COMPLY WITH SECTION 11B-502, AT LEAST ONE SHALL BE A VAN PARKING SPACE COMPLYING WITH SECTION 11B-502.

PARKING SPACES COMPLYING WITH SECTION 11B-502 THAT SERVE A PARTICULAR BUILDING OR FACILITY SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE FROM PARKING TO AN ENTRANCE COMPLYING WITH SECTION 11B-206.4. WHERE PARKING SERVES MORE THAN ONE ACCESSIBLE ENTRANCE, PARKING SPACES SHALL BE DISPERSED AND LOCATED ON THE SHORTEST ACCESSIBLE ROUTE TO THE ACCESSIBLE ENTRANCES. IN PARKING FACILITIES THAT DO NOT SERVE A PARTICULAR BUILDING OR FACILITY, PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE TO AN ACCESSIBLE PEDESTRIAN ENTRANCE OF THE PARKING FACILITY.

11B-209 PASSENGER LOADING ZONES AND BUS STOPS
PASSENGER LOADING ZONES, EXCEPT THOSE REQUIRED TO COMPLY WITH SECTION 11B-209.2 AND 11B-209.2.3, SHALL PROVIDE AT LEAST ONE PASSENGER LOADING ZONE COMPLYING WITH SECTION 11B-503 IN EVERY CONTINUOUS 100 LINEAR FEET OF LOADING ZONE SPACE, OR FRACTION THEREOF.

11B-303 CHANGES IN LEVEL
CHANGES IN LEVEL OF $\frac{1}{4}$" HIGH MAXIMUM SHALL BE PERMITTED TO BE VERTICAL AND WITHOUT EDGE TREATMENT.

CHANGES IN LEVEL BETWEEN $\frac{1}{4}$" HIGH MINIMUM AND $\frac{1}{2}$"HIGH MAXIMUM SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2.

CHANGES IN LEVEL GREATER THAN $\frac{1}{2}$" HIGH SHALL BE RAMPED, AND SHALL COMPLY WITH SECTION 11B-405 OR 11B-406.

ABRUPT CHANGES IN LEVEL EXCEEDING 4" IN A VERTICAL DIMENSION BETWEEN WALKS, SIDEWALKS OR OTHER PEDESTRIAN WAYS AND ADJACENT SURFACES OR FEATURES SHALL BE IDENTIFIED BY WARNING CURBS AT LEAST 6" IN HEIGHT ABOVE THE WALK OR SIDEWALK SURFACE.

11B-402 ACCESSIBLE ROUTES
ACCESSIBLE ROUTES SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING COMPONENTS: WALKING SURFACES WITH A RUNNING SLOPE NOT STEEPER THAN 1:20, DOORWAYS, RAMPS, CURB RAMPS EXCLUDING THE FLARED SIDES, ELEVATORS, AND PLATFORM LIFTS. ALL COMPONENTS OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF DIVISION 4.

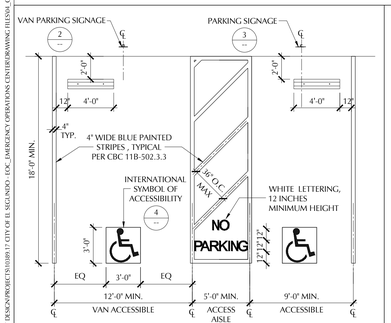
11B-403 WALKING SURFACES
WALKING SURFACES THAT ARE A PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH SECTION 11B-403.

THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20. THE CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48.

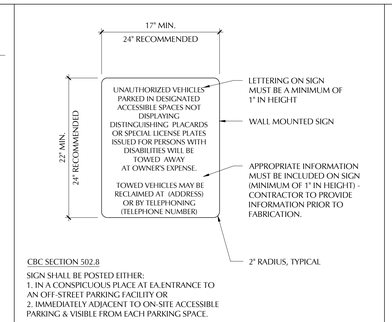
EXCEPT AS PROVIDED IN SECTION 11B-403.5.2 AND 11B-403.5.3, THE CLEAR WIDTH OF WALKING SURFACES SHALL BE 36" MINIMUM.

"ACCESSIBLE ROUTE" IS DEFINED AS A CONTINUOUS UNOBSTRUCTED PATH CONNECTING ACCESSIBLE ELEMENTS AND SPACES OF AN ACCESSIBLE SITE, BUILDING OR FACILITY THAT CAN BE NEGOTIATED BY A PERSON WITH DISABILITY USING A WHEELCHAIR, AND THAT IS ALSO SAFE FOR AND USABLE BY PERSONS WITH OTHER DISABILITIES."

1 SITE PLAN (REFERENCE ONLY) — SCALE: NTS

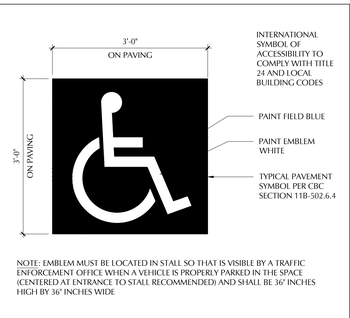


6 ADA PARKING STALLS — SCALE: 3/16" = 1'-0"



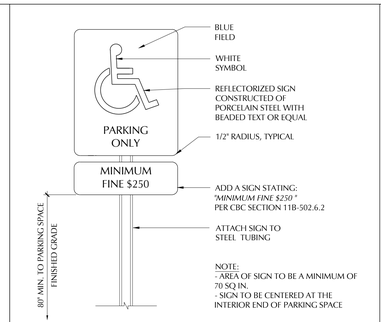
CBC SECTION 502.8
SIGN SHALL BE POSTED EITHER:
1. IN A CONSPICUOUS PLACE AT EA.ENTRANCE TO AN OFF-STREET PARKING FACILITY OR
2. IMMEDIATELY ADJACENT TO ON-SITE ACCESSIBLE PARKING & VISIBLE FROM EACH PARKING SPACE.

5 PARKING SIGNAGE — SCALE: N.T.S.

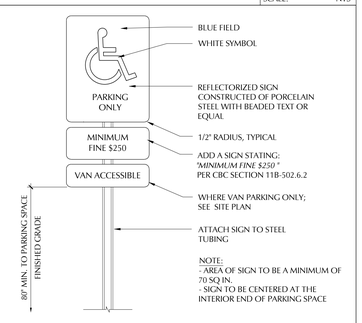


NOTE: EMBLEM MUST BE LOCATED IN STALL SO THAT IS VISIBLE BY A TRAFFIC ENFORCEMENT OFFICE WHEN A VEHICLE IS PROPERLY PARKED IN THE SPACE (CENTERED AT ENTRANCE TO STALL RECOMMENDED) AND SHALL BE 36" INCHES HIGH BY 36" INCHES WIDE

4 INTERNATIONAL EMBLEM — SCALE: NTS



3 PARKING SIGNAGE — SCALE: NTS



2 VAN PARKING SIGNAGE — SCALE: NTS

KEYNOTES

(#) KEYNOTE REFERENCE

1 PD LOBBY

2 AREA OF CONSTRUCTION EOC / MPR

SYMBOL LEGEND

NIC — EXISTING BUILDING NOT IN CONTRACT

PROPOSED TENANT IMPROVEMENT

PATH OF TRAVEL (P.O.T) AS INDICATED IS A BARRIER FREE ACCESS ROUTE WITHOUT ANY ABRUPT VERTICAL CHANGES EXCEEDING 1/2" BEVELED AT 1:2 MAXIMUM SLOPE, EXCEPT THAT LEVEL CHANGES DO NOT EXCEED 1/4" VERTICAL AND IS AT LEAST 48" WIDE. SURFACE IS SLIP RESISTANT, STABLE, FIRM & SMOOTH. CROSS-SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5% UNLESS OTHERWISE INDICATED. (P.O.T) SHALL MAINTAIN FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM (11B-307.4) AND PROTRUDING OBJECTS GREATER THAN 4" PROJECTION FROM WALL AND ABOVE 27" AND LESS THAN 80" (11B-307.2). CONTRACTOR TO VERIFY THAT ALL BARRIERS IN THE PATH OF TRAVEL HAVE BEEN REMOVED OR WILL BE REMOVED UNDER THIS PROJECT, AND PATH OF TRAVEL COMPLIES WITH CBC SECTION 1134B/ CHAPTER 11 ACCESSIBILITY FOR EXISTING BUILDINGS

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ARCHITECT:
LICENSED ARCHITECT EDUARDO TAGLE KARDENT C-35088 March 31, 2027 STATE OF CALIFORNIA

DATE SIGNED: 05/21/26

CONSULTANT:

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EMERGENCY OPERATIONS CENTER (EOC)
348 MAIN STREET
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DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
SITE PLAN (REFERENCE ONLY)

SHEET NUMBER:
A-0.8

PROJECT:	SCALE:	DATE:
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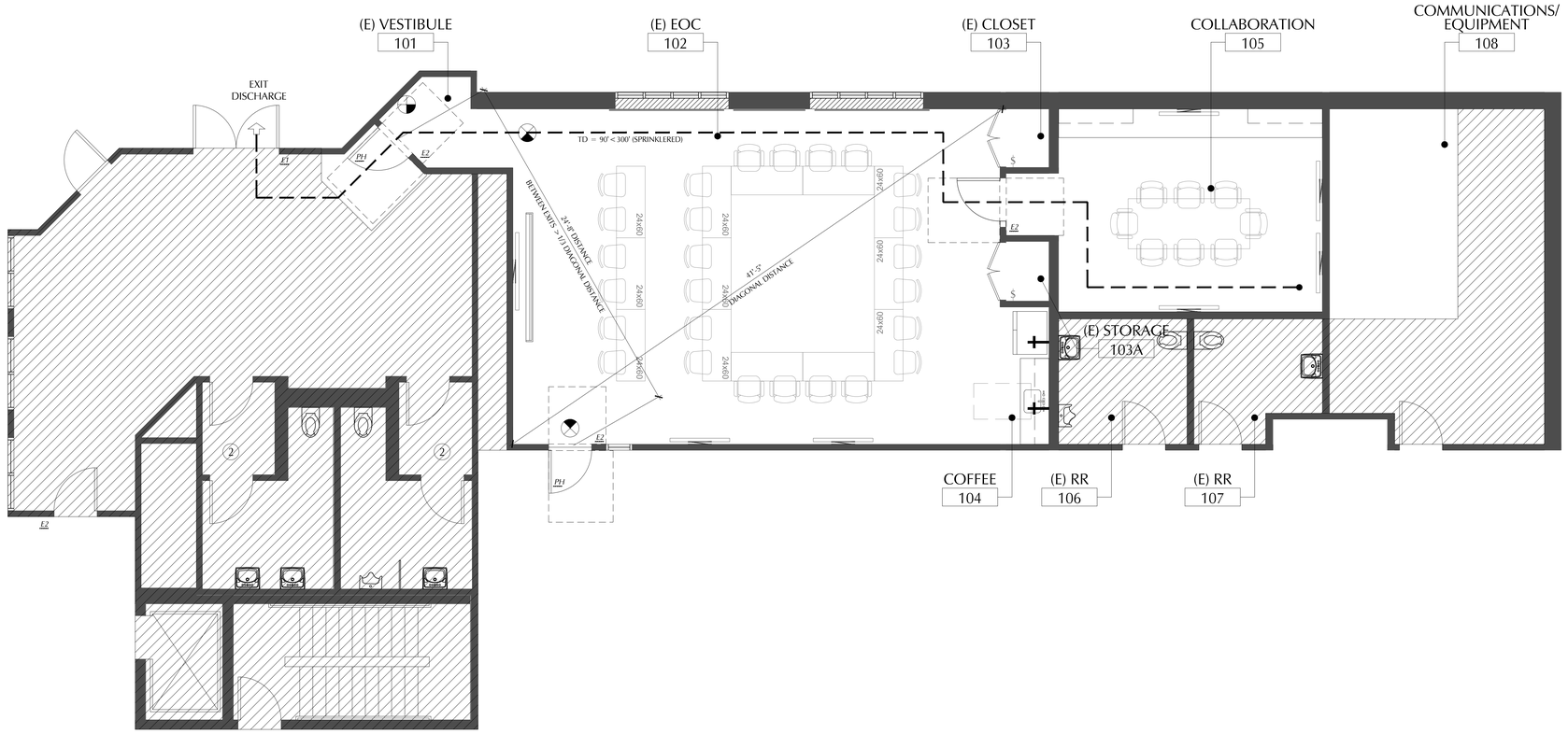


1 EGRESS PLAN | GROUND FLOOR

SCALE: 1/4" = 1'-0"

OCCUPANT LOAD STUDY - 1ST FLOOR

ROOM NUMBER	SF	LOAD FACTOR	# OF OCCUPANTS	EXITS REQUIRED	EXITS PROVIDED
EOC					
VESTIBULE 101	43	150	1	1	1
EOC 102	801	15	53	1	1
STORAGE 103	15	300	1	1	1
COFFEE 104	31	150	1	1	1
COLLABORATION 105	282	15	19	1	1
EOC SUITE	1,172	--	75	2	2

EGRESS GENERAL NOTES

1 REFER TO GENERAL NOTES SHEETS FOR FIRE DEPARTMENT NOTES

2 EXISTING RESTROOMS. ADA UPGRADES UNDER SEPARATE PERMIT

SYMBOL LEGEND

CBC 1017 - EXIT ACCESS TRAVEL DISTANCE:
CBC 1017.3 MEASUREMENT - EXIT ACCESS TRAVEL DISTANCE SHALL BE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF HORIZONTAL AND VERTICAL EGRESS TRAVEL TO THE ENTRANCE TO AN EXIT. EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2 (200 FEET WITHOUT SPRINKLER SYSTEM)

COMMON PATH OF TRAVEL:
CBC DEFINITION - THAT PORTION OF EXIT ACCESS TRAVEL DISTANCE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY TO THAT POINT WHERE THE OCCUPANTS HAVE SEPARATE ACCESS TO TWO EXITS OR EXIT ACCESS DOORWAYS. COMMON PATH OF TRAVEL SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1006.2.1, 75 FEET WITHOUT SPRINKLER SYSTEM)

EXIT SIGN (ILLUMINATED).
EXISTING TO REMAIN AND PROTECT IN PLACE
WITH BACK-UP POWER FOR A DURATION OF NOT LESS THAN 90 MINUTES (VERIFY W/ OWNERSHIP BATTERY OR EMERGENCY CIRCUIT)

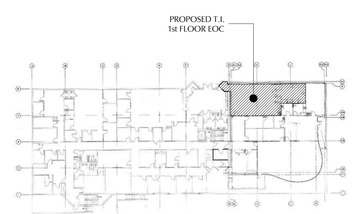
FE
FIRE EXTINGUISHER TYPE 2A-10BC: SURFACE MOUNT
MAXIMUM DISTANCE OF TRAVEL TO CLASS A FIRE EXTINGUISHER PER CBC TABLE 906.3(1) = 75 FEET MAXIMUM TRAVEL DISTANCE
CBC 906.9.1 - EXTINGUISHERS WEIGHING 40 POUNDS OR LESS SHALL BE INSTALLED SO THAT THEIR TOPS ARE NOT MORE THAN 4 FEET ABOVE THE FLOOR. ALL FIRE EXTINGUISHERS SHALL BE CLEARLY VISIBLE FOR ALL OCCUPANTS AND FROM ALL ADJACENT AREAS.

PH EXISTING DOOR EQUIPPED W/ PANIC HARDWARE

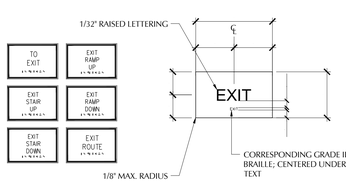
E1 PROVIDE SIGNAGE: EACH GRADE-LEVEL EXTERIOR EXIT DOOR SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE WORD: *"EXIT."*

E2 PROVIDE SIGNAGE: EACH EXIT DOOR THAT LEADS DIRECTLY TO A GRADE-LEVEL EXTERIOR EXIT BY MEANS OF AN EXIT ENCLOSURE THAT DOES NOT UTILIZE A STAIR OR RAMP, OR AN EXIT PASSAGEWAY AND EXIT ACCESS DOORS FROM AN INTERIOR ROOM OR AREA THAT IS REQUIRED TO HAVE A VISUAL SIGN SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE WORDS, *"EXIT ROUTE."*

KEYPLAN



WHITE SIGN WITH CHARCOAL GRAY LETTERING



PER CBC SECTION 1013.1 WHERE REQUIRED, EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE PATH OF EGRESS TRAVEL TO EXIT SIGNS TO CLEARLY INDICATED THE DIRECTION OF EGRESS TRAVEL IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS. INTERVENING MEANS OF EGRESS DOORS WITHIN EXITS SHALL BE MARKED BY EXIT SIGNS. EXIT SIGN PLACEMENT SHALL BE SUCH THAT NO POINT IN AN EXIT ACCESS CORRIDOR OR EXIT PASSAGEWAY IS MORE THAN 100 FEET OR THE LISTED VIEWING DISTANCE FOR THE SIGN, WHICHEVER IS LESS, FROM THE NEAREST VISIBLE EXIT SIGN.

3 EXIT SIGNAGE

SCALE: 1/4" = 1'-0"

11B-703.4.2 LOCATION. WHERE A *TACTILE* SIGN IS PROVIDED AT A DOOR, THE SIGN SHALL BE LOCATED ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A *TACTILE* SIGN IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A *TACTILE* SIGN IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAFS, THE SIGN SHALL BE LOCATED TO THE RIGHT OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE AT THE LATCH SIDE OF A SINGLE DOOR OR AT THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE LOCATED ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING *TACTILE CHARACTERS* SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18 INCHES (455mm) MIN. BY 18 INCHES (455mm0 MIN., CENTERED ON THE *TACTILE CHARACTERS*, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION.

EXCEPTION: SIGNS WITH *TACTILE CHARACTERS* SHALL BE PERMITTED ON THE PUSH SIDE OF DOORS WITH CLOSERS AND WITHOUT HOLD-OPEN DEVICES.

TYPICAL SIGN TEXT - CBC 1011.4, 11B-703
EXIT / EGRESS ROUTE SIGNS NON-GLARE TACTILE SIGNS SHALL BE MOUNTED ON WALL AT LATCH SIDE OF THE DOOR AND SHALL IDENTIFY ACCESSIBLE EXIT/EGRESS ROUTES, BUILDING EXITS AND DOORS THAT OPEN DIRECTLY TO AN EXIT ROUTE, VERIFY INFORMATION PER PLANS

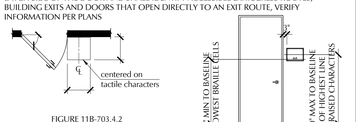


FIGURE 11B-703.4.2
LOCATION OF TACTILE SIGNS AT DOORS

2 LOCATION OF TACTILE SIGN

SCALE: 1/4" = 1'-0"

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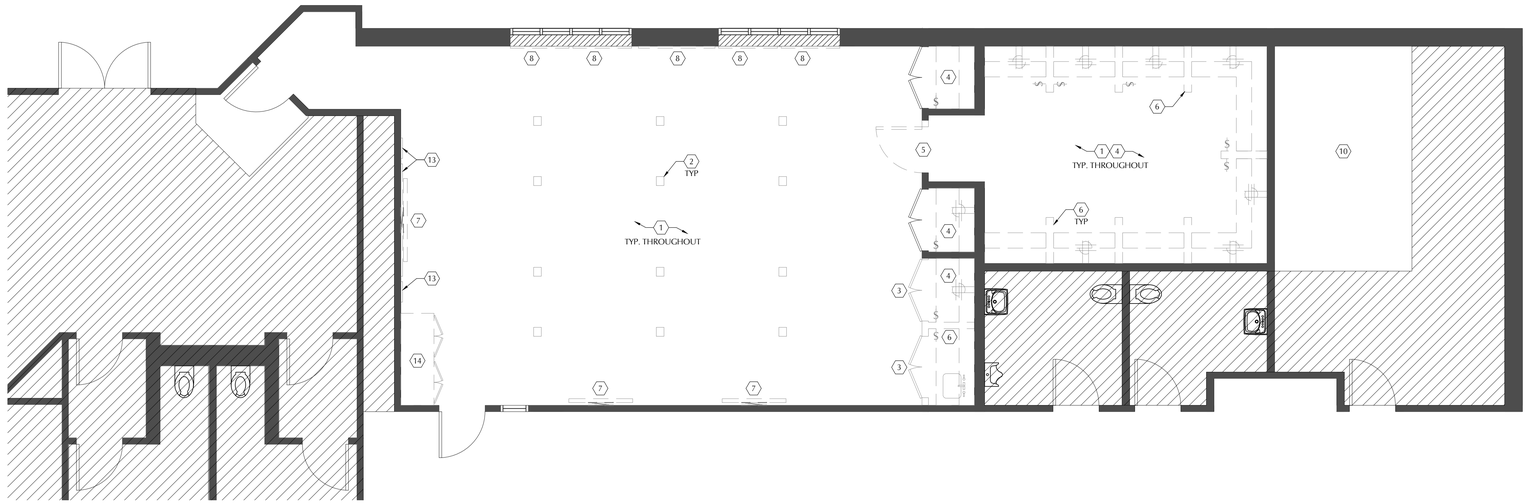
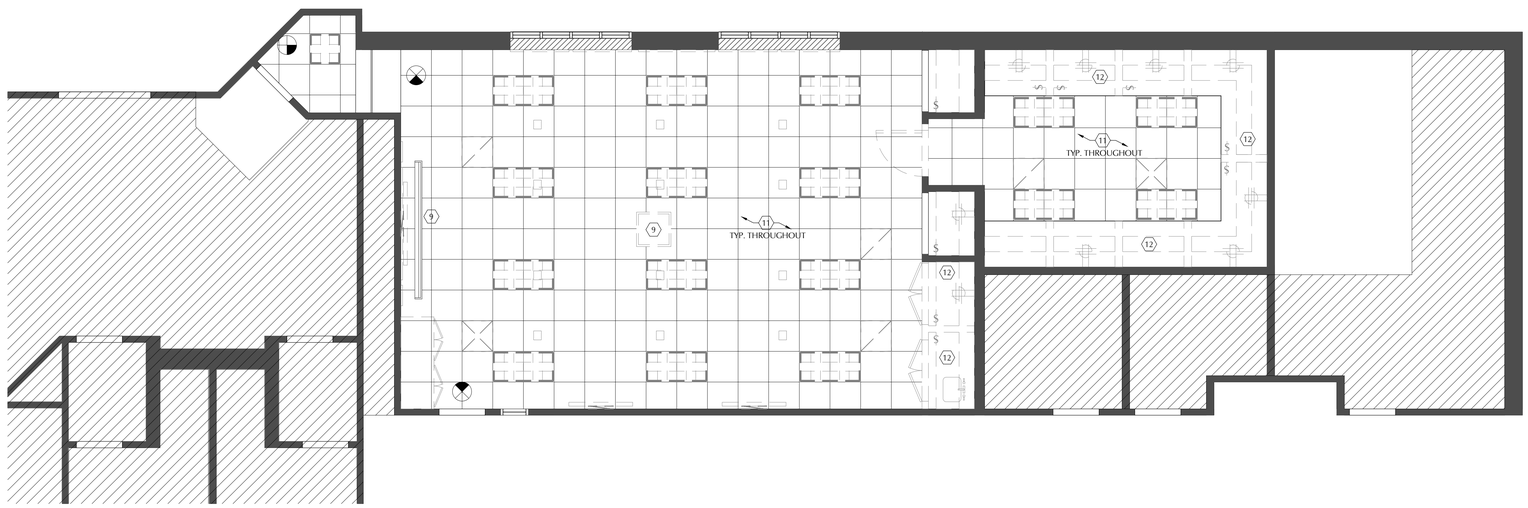


1 DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



2 CEILING DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

SYMBOL LEGEND

EXISTING DOOR TO REMAIN

EXISTING PARTITION TO REMAIN;
GENERAL CONTRACTOR TO PATCH AND REPAIR ALL SCARS AS REQUIRED

REMOVE EXISTING DOOR ASSEMBLY

REMOVE EXISTING WALLS AND ASSOCIATED ELECTRICAL / DATA

REVISION MARK
REVISION CLOUD

DEMOLITION KEYNOTES

(#) KEYNOTE REFERENCE

1 DEMO ALL EXISTING WALL COVERING, BASE AND FLOORING THROUGHOUT

2 DEMO EXISTING IN-FLOOR COVER PLATES AND PREP TO RECEIVE NEW IN SAME LOCATIONS

3 DEMO EXISTING CLOSET, CONTENTS WITHIN AND DOOR ASSEMBLY COMPLETELY. CAP OFF ANY EXISTING PLUMBING IN PLACE.

4 DEMO EXISTING MILLWORK

5 TEMPORARILY REMOVE EXISTING DOOR AND SAVE FOR RE-USE. DEMO PORTION OF EXISTING WALL AS REQUIRED TO ACHIEVE REQUIRED PUSH/PULL DIMENSION AT LATCH SIDE OF DOOR

6 DEMO EXISTING NON-STRUCTURAL WING WALLS

7 REMOVE EXISTING WALL MOUNTED TV/S AND MOUNTING BRACKET/S

8 REMOVE EXISTING WHITE BOARDS

9 DEMO EXISTING CEILING MOUNTED PROJECTOR AND ASSOCIATED MOUNTH HARDWARE COMPLETELY; EXISTING IN CEILING PROJECTION SCREEN TO REMAIN. PROTECT IN PLACE.

10 EL SEGUNDO IT DEPT TO REMOVE UN-USED EQUIPMENT AND PROVIDE SPACE FOR NEW AV CABINET / SYSTEM

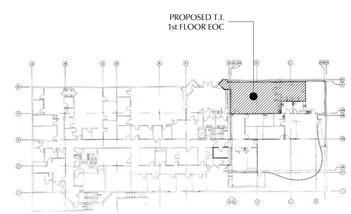
11 DEMO ALL EXISTING LIGHTING THROUGHOUT. EXISTING CEILING GRID AND TILE TO REMAIN. REMOVE AND REPLACE ANY DAMAGED OR STAINED TILES.

12 EXISTING GYP BOARD SOFFIT TO REMAIN. PATCH AND REPAIR AS REQUIRED

13 TEMPORARILY REMOVE AND SAVE FOR REINSTALLATION EXISTING WALL PLAQUES, PD SEALS/SIGNAGE.

14 REMOVE EXISTING METAL CABINETS

KEYPLAN



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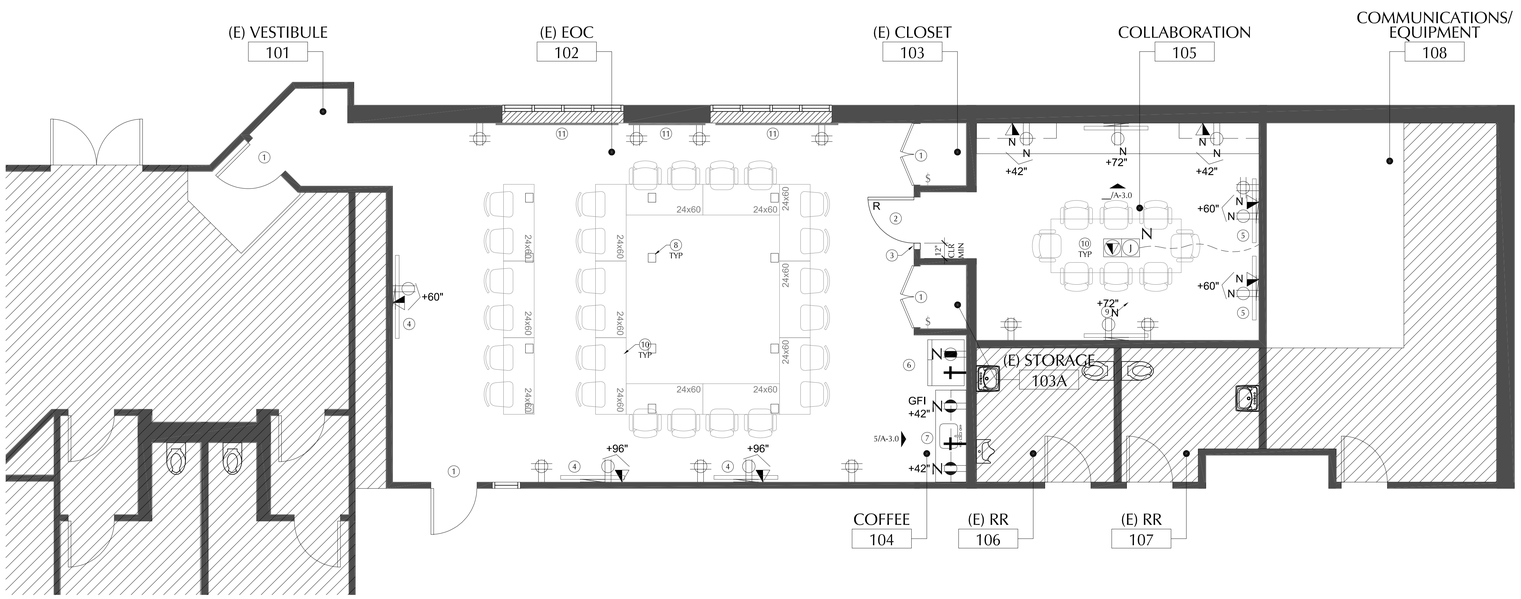
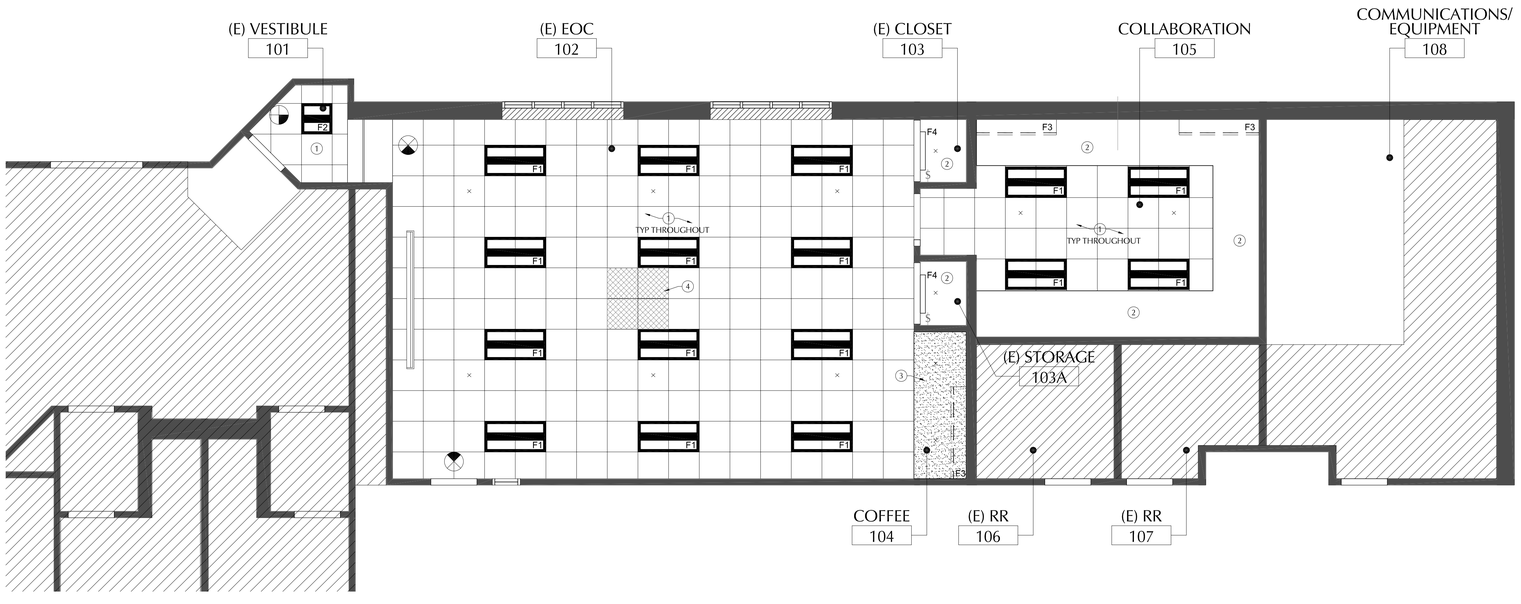


1 CONSTRUCTION AND POWER PLAN

SCALE: 1/4" = 1'-0"



2 CEILING PLAN

SCALE: 1/4" = 1'-0"

SYMBOL LEGEND

- N — INDICATES NEW ITEM
- R — INDICATES RELOCATED ITEM
- OFFICE / XXX — ROOM NAME / ROOM NUMBER
- 1/A-7.0 — ELEVATION MARK
- REVISION MARK / REVISION CLOUD
- EXISTING DOOR TO REMAIN
- EXISTING PARTITION TO REMAIN; GENERAL CONTRACTOR TO PATCH & REPAIR ALL SCARS AS REQUIRED
- NEW MILLWORK AS INDICATED
- SINGLE GANG TELEPHONE BOX/DATA. PROVIDE 3/4" CONDUIT AND STUB-UP AT +6" ABOVE THE CEILING MOUNT BOX AT THE SAME HEIGHT AS THE ELECTRICAL OUTLET BOX (V/D CABLES); WALL MOUNTED AT 15" AFF UNO
- QUADRAPLEX ELECTRICAL WALL OUTLET, PROVIDE 120V, SINGLE PHASE, 15 AMP THREE WIRE (GROUNDED), WITH 1/2" CONDUIT; WALL MOUNTED AT 15" AFF UNO
- DEDICATED DUPLEX ELECTRICAL OUTLET. PROVIDE 220V, SINGLE PHASE, 20 AMP., THREE WIRE (GROUNDED), WITH 1/2" CONDUIT; WALL MOUNTED AT 15" AFF UNO
- DUPLEX ELECTRICAL OUTLET. PROVIDE 120 V, SINGLE PHASE,15 AMP, THREE WIRE (GROUNDED) WITH 1/2" CONDUIT; WALL MOUNTED AT 15" AFF UNO
- NEW 2X4 OR 2X2 LED LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS
- NEW UNDER CABINET LED LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS
- NEW SURFACE MOUNTED LED LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS
- EXISTING CEILING GRID AND ACOUSTIC TILE TO REMAIN
- EXISTING SPRINKLER HEAD
- DETAIL NUMBER / DETAIL SHEET
- NIC — EXISTING BUILDING NOT IN CONTRACT
- ALIGN
- WATERLINE FOR REFRIGERATOR

CONSTRUCTION KEYNOTES

(#) KEYNOTE REFERENCE

1 EXISTING DOOR TO REMAIN. PROTECT IN PLACE

2 RELOCATED DOOR AND HARDWARE TO BE RE-USED

3 NEW PARTITION INFILL TO MATCH EXISTING ADJACENT CONDITIONS. MATCH FRAMING, DRYWALL, TAPE, MUD AND SAND READY FOR NEW PAINT FINISH

4 NEW TELEVISION AND NEW TV MOUNT. SEE TECHNOLOGY DRAWINGS FOR SPECS.

5 NEW TELEVISION & MOUNTING BRACKET. SEE TECHNOLOGY DRAWINGS FOR SPECS. EXACT LOCATION TO BE VERIFIED IN FIELD WITH STAKE HOLDER

6 NEW COUNTER DEPTH REFRIGERATOR
MANUF: FRIGIDAIRE PROFESSIONAL
MODEL: PRFG2383AF
FINISH: STAINLESS STEEL
SIZE: 70" H x 36" W x 23" D (28-1/2" W/ DOOR)
NOTE: PURCHASED AND INSTALLED BY CONTRACTOR
NOTE: PROVIDE WATER LINE

7 NEW UNDER MOUNT ADA SINK AND FAUCET. EXTEND EXISTING PLUMBING AS REQUIRED FOR PROPOSED LAYOUT.
SINK SPEC
MANUF: ELKAY
MODEL: ELUHAD211545PD
FINISH: STAINLESS STEEL
SIZE: 23-1/2" x 18-1/4" x 4-3/8"
NOTE:
FAUCET SPEC
MANUF: CHICAGO FAUCETS
MODEL: 434-ABCP
FINISH: POLISH
NOTE:

8 NEW FLUSH MOUNTED FLOOR COVER PLATES, TYP THROUGHOUT. EXISTING POWER TO REMAIN. NEW AV/LOW VOLTAGE PER TECHNOLOGY DRAWINGS
NOTE: CONTRACTOR SUB TO VERIFY EXISTING FLOOR BOXES AND PROVIDE OPTIONS OF COMPATIBLE FLOOR COVER PLATES

9 NEW LEGRAND FLEX RACEWAY SYSTEM, SURFACE MOUNTED BELOW CARPET. SEE ELECTRICAL DRAWINGS FOR MORE INFO.

10 NEW MOBILE/FOLDABLE WORK STATION/S, CONFERENCE TABLE AND CHAIRS ARE SHOWN FOR REFERENCE ONLY. UNITS ARE TO BE PROCURED AND INSTALLED BY STAKEHOLDER.

11 NEW WALL MOUNTED MAGNETIC DRY ERASE BOARD/S
SIZE: (2) 5'0" W x 3'-0" H & (1) 5'-0" W x 4'-0" H
NOTE: MOUNT SIMILAR TO EXISTING PRIOR TO DEMO

CEILING KEYNOTES

(#) KEYNOTE REFERENCE

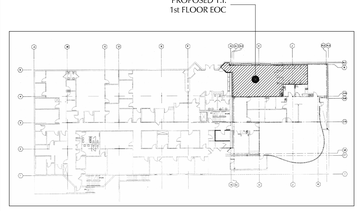
1 EXISTING CEILING GRID AND TILE TO REMAIN THROUGHOUT. REPLACE ANY DAMAGED OR STAINED TILES WITH NEW TO MATCH, TYP THROUGHOUT U.N.O.

2 EXISTING GYP BOARD CEILING TO REMAIN. PATCH AND REPAIR AS REQUIRED

3 NEW GYP BOARD CEILING SOFFIT; RETROFIT AND MAINTAIN EXISTING GYP BOARD CEILING WHERE CLOSET DOORS & WING WALL HAVE BEEN REMOVED.

4 RETROFIT / EXTEND EXISTING CEILING GRID AND PROVIDE NEW CEILING TILE AS REQUIRED WHERE PROJECTOR HAS BEEN REMOVED.

KEYPLAN



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ARCHITECT:

DATE SIGNED: 05/21/26

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REVISIONS:

NO.:	DATE:	DESCRIPTION:
	06/16/26	BID SET

PLAN CHECK:
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PROJECT:
CITY OF EL SEGUNDO
EMERGENCY OPERATIONS
CENTER (EOC)

348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
CONSTRUCTION, POWER AND CEILING PLANS

SHEET NUMBER:
A-2.0

PROJECT:	SCALE:	DATE:
10389.17	AS NOTED	FEB 2026

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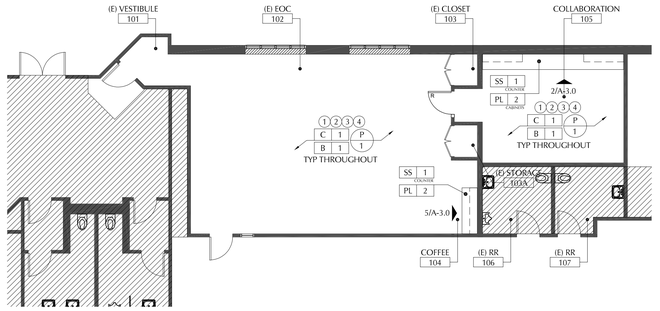
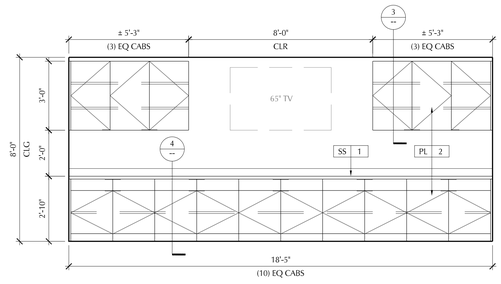
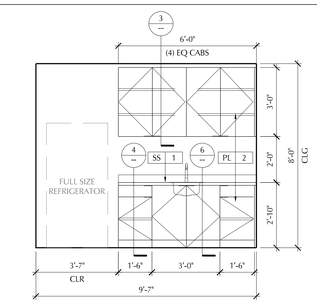
CAUTION: IF THIS PRINT IS NOT 30"X42" THEN IT IS A REDUCED PRINT



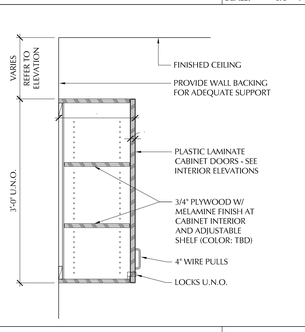
1 FINISH PLAN — SCALE: 1/8" = 1'-0"



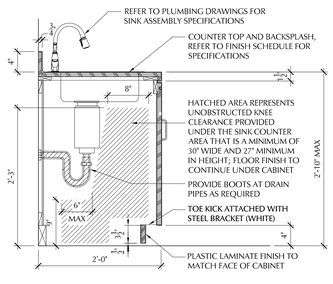
2 ELEVATIONS AT COLLABORATION RM 105 — SCALE: 3/8" = 1'-0"



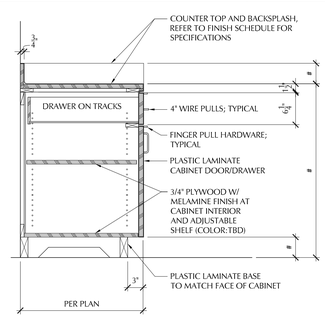
5 ELEVATIONS AT COFFEE 105 — SCALE: 3/8" = 1'-0"



3 UPPER CABINET — SCALE: 1" = 1'-0"



6 BASE CABINET - SINK — SCALE: 1" = 1'-0"



4 BASE CABINET — SCALE: 1" = 1'-0"

FINISH PLAN LEGEND

FINISH MATERIAL REFERENCE / FINISH MATERIAL NUMBER — FIN --

FLOOR FINISH TRANSITION, TO BE BUILDING CODE AND ADA COMPLIANT

INTERIOR WALL/CEILING FINISH NOTES

803.1.1 INTERIOR WALL AND CEILING FINISH MATERIALS.
INTERIOR WALL AND CEILING FINISH MATERIALS SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM E84 OR UL 723. SUCH INTERIOR FINISH MATERIALS SHALL BE GROUPED IN THE FOLLOWING CLASSES IN ACCORDANCE WITH THEIR FLAME SPREAD AND SMOKE-DEVELOPED INDEXES.

CLASS A: = FLAME SPREAD INDEX 0-25; SMOKE-DEVELOPED INDEX 0-450.

CLASS B: = FLAME SPREAD INDEX 26-75; SMOKE-DEVELOPED INDEX 0-450.

CLASS C: = FLAME SPREAD INDEX 76-200; SMOKE-DEVELOPED INDEX 0-450.

EXCEPTION: MATERIALS TESTED IN ACCORDANCE WITH SECTION 803.1.2.

CABINET CONSTRUCTION

CABINET CONSTRUCTION

G1. CABINETS SHALL MEET CBC ACCESSIBILITY REQUIREMENTS
G2. CABINET HARDWARE SHALL BE A MINIMUM OF 4" WIDE
G3. DOORS SHALL BE FLUSH OVERLAY, UNO
G4. PROVIDE PLASTIC SCREW COVERS AT CONCEALED/SEMI-EXPOSED SCREW HEADS
G5. ALL HORIZONTAL AND VERTICAL JOINTS BETWEEN DOORS AND DRAWERS SHALL BE 1/8"
G6. FIELD VERIFY SITE CONDITIONS PRIOR TO FABRICATION
G7. SUBMIT SHOP DRAWINGS TO KARDENT FOR APPROVAL PRIOR TO FABRICATION
G8. SUBMIT ALL HARDWARE TO KARDENT FOR APPROVAL PRIOR TO FABRICATION
G9. FINISH FLOORING SHOULD EXTEND UNDER APPLIANCES AND UNDER SINK CABINET
G10. EXPOSED AND SEMI-EXPOSED EDGES SHALL RECEIVE MATCHING PVC EDGE BANDING OR .030 PLASTIC LAMINATE
G11. TOE KICKS SHALL BE PLASTIC LAMINATE UNO
G12. ALL CABINET SHELVES SHALL BE ADJUSTABLE UNO
G13. SCRIBE CABINETS AND COUNTERTOPS TO WALL
G14. ALL CAULKING TO MATCH COLOR OF ADJACENT MATERIAL

FINISH SCHEDULE

C 1
ITEM :CARPET
LOCATION :TYP. THROUGHOUT
MANUFACTURER :MOHAWK
STYLE :SHARED PATH BT429
COLLECTION :ART STYLE
COLOR :569 CADET
PATTERN :RANDOM
INSTALLATION :PER MANUFACTURER

B 1
ITEM :RUBBER BASE
LOCATION :TYP. THROUGHOUT
MANUFACTURER :TARKETT
SIZE :4"
COLOR :BURNT UMBER 63
INSTALLATION :PER MANUFACTURER

P 1
ITEM :PAINT - WALLS
LOCATION :PER PLAN
MANUFACTURER :DUNN EDWARDS
COLOR :DEW341, SWISS COFFEE
FINISH :VELVET
INSTALLATION :2 COATS MINIMUM

SS 1
ITEM :QUARTZ
LOCATION :COUNTERTOPS
MANUFACTURER :CESARSTONE
COLOR :MISTY CARRERA
NUMBER :4141
FINISH :POLISHED
INSTALLATION :PER MANUFACTURER

PL 2
ITEM :PLASTIC LAMINATE
LOCATION :CABINET FACES (UPPER AND LOWERS)
MANUFACTURER :WILSONART
COLOR :STERLING ASH
NUMBER :T995-36
FINISH :FINE VELVET FINISH
INSTALLATION :PER MANUFACTURER

FINISH PLAN KEYNOTES

(1) KEYNOTE REFERENCE

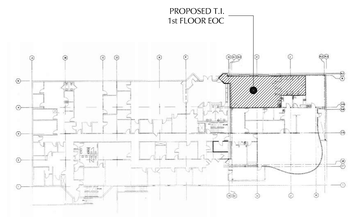
1 PROVIDE & INSTALL NEW BUILDING CODE AND ADA COMPLIANT THRESHOLD OR TRANSITION STRIP AT FLOORING FINISH INTERSECTIONS

2 TOUCH UP PAINT AS REQUIRED, TYP THROUGHOUT, MATCH EXISTING. EXTEND TO NEAREST WALL CORNER/EDGE.

3 PROVIDE & INSTALL NEW CARPET PER MANUFACTURE'S INSTRUCTIONS.

4 PROVIDE & INSTALL NEW PAINT MANUFACTURE'S INSTRUCTIONS.

KEYPLAN



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ARCHITECT:

LICENSED ARCHITECT — GERARD FAJARDO — C-35088 — March 31, 2027 — RENEWAL DATE — STATE OF CALIFORNIA

DATE SIGNED: 05/21/26

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EMERGENCY OPERATIONS CENTER (EOC)
348 MAIN STREET
EL SEGUNDO, CA 90245

DRAWN BY:	CHECKED BY:
-	MQ

SHEET TITLE:
FINISH PLANS, FURNITURE AND INTERIOR ELEVATIONS

SHEET NUMBER:
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PROJECT:	SCALE:	DATE:
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