

CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECTS



PROJECT MANUAL

Public Safety Building Jail Automation Upgrades

SPECIFICATION NO. 25-11684-C

November, 2025

ADVERTISEMENT DATE: November 3, 2025

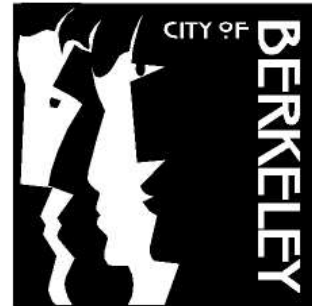
PRE-BID CONFERENCE: November 18, 2025

BID OPENING DATE: Thursday, February 19, 2026

Document 00 0101

CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS



PROJECT MANUAL

Public Safety Building Jail Automation Upgrades

at

2100 Martin Luther King Jr Way
Berkeley, CA 94704

SPECIFICATION NO. 25-11684-C
November, 2025

Prepared By:

Titus Chen for Elmar Kapfer

C571E59CB4EA4E7
Elmar Kapfer, Supervising Civil Engineer

Reviewed By:

C92C587E517B4DE...
Ronald Nevels, City Engineer

ENGINEERING DIVISION
1947 CENTER STREET, 4TH FLOOR
BERKELEY, CALIFORNIA 94704

Project Manager
Uriel Gonzalez, Assitant PW Engineer
Phone: (510) 981-6627
Email: UGonzalez@berkeleyca.gov

1947 Center Street, Berkeley, California 94704

(510) 981-6400

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DOCUMENT 00 1113**NOTICE INVITING BIDS****ARTICLE 1 - INVITATION TO BID**

- 1.01 Notice Inviting Bids:** City of Berkeley ("City") will receive sealed Bids at City of Berkeley, Purchasing Manager's Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until **2:00 PM, Thursday, February 19, 2026** for the following public work:

**SPECIFICATION NO. 25-11684-C
CITY OF BERKELEY
Public Safety Building Jail Automation Upgrades
2100 Martin Luther King Jr Way**

- 1.02 Project Description:** Upgrades to the low-voltage systems in the first-floor detention area, including modifications to cell and entry door controls, replacement of audio and video surveillance equipment, installation of HVAC systems, and conversion of a storage room into a climate-controlled telecommunications room, including ancillary work in accordance with the terms and conditions of the Contract Documents. Work shall be completed within **126** Calendar Days from the date when Contract Time commences to run.
- 1.03 Procurement of Bidding Documents:**
Bidding Documents contain the full description of the Work. Bidders may obtain Bidding Documents by November 3, 2025 from City of Berkeley's Public Works website under Current Construction Project Bid Opportunities:
<https://berkeleyca.gov/doing-business/working-city/bid-proposal-opportunities>
For information pertaining to the Bidding Documents, please contact the Project Manager, Uriel Gonzalez, 1947 Center Street, 5th Floor, Berkeley, CA 94704, by Email at UGonzalez@berkeleyca.gov or by Telephone at (510) 981-6627 or by FAX **(510) 981-6390**.
- 1.04 Planholders List:**
Bidders are responsible for notifying Uriel Gonzalez, via email at UGonzalez@berkeleyca.gov to be included on the Planholders List. Please include the following in the email subject header: "Planholders list for Specification No. 25-11684-C for Public Safety Building Jail Automation Upgrades". In the body of the email, please state the Name of the Company Representative, Company Name, Address, Telephone Number, Fax Number, and Email Address.
- 1.05 Instructions:** Bidders shall refer to Document 00 2113 (Instructions to Bidders) for required documents and items to be submitted in a sealed envelope for deposit into the Bid Box, located at **City of Berkeley, Purchasing Manager's Office, Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320** no later than the time and date set forth in Paragraph 1.01 above.
- 1.06 Non-Mandatory Pre-Bid Site Visit:** City **WILL** conduct a Non-Mandatory Pre-Bid Conference and Site Visit at 2100 Martin Luther King Jr Way. The location of work is open to the public during normal business or daylight hours. It is recommended that potential bidders visit the site independently to review site conditions prior to bid. City will conduct a Pre-Bid Conference and Site Visit at 2100 Martin Luther King Jr Way, at 10:00 AM November 18, 2025
- 1.07 Bid Preparation Cost:** Bidders are solely responsible for the cost of preparing their Bids.

- 1.08 Reservation of Rights:** City specifically reserves the right, in its sole discretion, to reject any or all Bids, to re-bid, or to waive inconsequential defects in bidding not involving time, price or quality of the work. City may reject any and all Bids and waive any minor irregularities in the Bids.

ARTICLE 2 - LEGAL REQUIREMENTS

- 2.01 Required Contractor's License(s):** A California "B" contractor's license is required to bid this contract. Joint ventures must secure a joint venture license prior to award of this Contract. Specialty work may require a specialty contractor's license, held by Bidder or a listed subcontractor.
- 2.02 Bid Alternates:** Bid alternates are identified in Document 00 4113 (Bid Form). The determination of lowest bid shall be based upon: Base contract bid price only.
- 2.03 Substitution of Securities:** City will permit the successful bidder to substitute securities for any retention monies withheld to ensure performance of the contract, as set forth in Document 00 6290 Escrow Agreement For Security Deposits In Lieu Of Retention and incorporated herein in full by this reference, in accordance with Section 22300 of the California Public Contract Code.
- 2.04 Prevailing Wage Laws:** The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at <http://www.dir.ca.gov/oprl/pwd/> and are deemed included in the Bidding Documents. The successful Bidder shall post the applicable prevailing wage rates at the Site.
- 2.05 Community Workforce Agreement:** This contract **WILL** be subject to the Community Workforce Agreement approved by the Berkeley City Council on June 23, 2015 (See Document 00 6580 – City of Berkeley Contracting Policies). The successful bidder and all subcontractors, at any tier, **WILL** be required to sign an Agreement to be Bound as a condition precedent to entering into any contract for this project.
- 2.06 First Source Construction Agreement:** This contract **WILL NOT** be subject to the First Source Construction Agreement (See Document 00 6580 – City of Berkeley Contracting Policies).
- 2.07** This contract **WILL (NOT)** be subject to Supplementary Conditions for Federal Funding. Section 00 7201.

END OF SECTION

DOCUMENT 00 2113**INSTRUCTIONS TO BIDDERS**

Bids are requested by City of Berkeley ("City"), for a general construction contract, or work described in general, as set forth in Document 00 1113 (Notice Inviting Bids), and the following additional terms.

ARTICLE 1 - PROCEDURES FOR SUBMISSION OF BIDS**1.01 Required Pre-Bid Conference and Site Visit**

- A. City **WILL** conduct a Non-Mandatory Pre-Bid Conference and Site Visit at 2100 Martin Luther King Jr Way, at November 18, 2025. The location of work is open to the public during normal business or daylight hours. It is recommended that potential bidders visit the site independently to review site conditions prior to bid.
- B. Questions regarding the site and the Bid Documents may be sent to the City's Representative to clarify such matters as Bidders may request. The Site Visit may be the Bidders' only opportunity to investigate conditions at the Site. Other Pre-Bid Site Visits may be scheduled at City's sole discretion, depending on staff availability.
- C. City will issue Minutes of the Pre-Bid Conference, which shall constitute the sole and exclusive record and statement of the results of the Pre-Bid Conference. The Minutes issued by City are not Contract Documents.

1.02 Required Pre-Bid Investigations

- A. Prior to submission of Bid, Bidder must conduct a careful examination of Bidding Documents and understand the nature, extent, and location of Work to be performed. Refer to Document 00 7200 (General Conditions) on required pre-bid investigations.
- B. Bidders may examine any available existing conditions information (e.g., record documents, specifications, studies, drawings of previous work), as well as applicable environmental assessment information (if any) regarding the Project, which will be posted on the website location indicated in Document 00 1113 (Notice Inviting Bids), paragraph 1.03.

1.03 Bidder Questions and Answers

- A. Bidders must direct all questions about the meaning or intent of Bidding Documents to City's Project Manager in writing as indicated in Document 00 1113 (Notice Inviting Bids), paragraph 1.03. Interpretations or clarifications considered necessary by City in response to such questions will be issued by written Addenda posted to the City's website.
- B. Questions received less than ten (10) calendar days prior to the date for opening Bids may not be answered.
- C. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect, and Bidders shall not rely on oral statements.

1.04 Addenda

- A. Addenda may also be issued to modify the Bidding Documents as deemed advisable by City. Addenda shall be acknowledged by number in Document 00 4113 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from City on the website as indicated in Document 00 1113 (Notice Inviting Bid), paragraph 1.03.
 - 1. It is the Contractor's responsibility to check the City's website for Addenda prior to submitting their bid.

ARTICLE 2 - RECEIPT OF BIDS**2.01** Date and Time

- A. Sealed Bids will be received by the City until the date and time indicated in Document 00 1113 (Notice Inviting Bids). All Bid envelopes will be time-stamped to reflect their submittal time. City shall reject all Bids received after the specified time and will return such Bids to Bidders unopened. Bidders must submit Bids in accordance with this Document 00 2113.

2.02 Two Envelope Bid Submission:

- A. City will receive Bids in opaque sealed 10 inch x 13 inch envelopes, containing the required items described herein.
- B. Bidders must submit Bids in two envelopes: "Envelope A – Bid Submittals" and "Envelope B – Statement of Qualifications."
- C. Bidders should mark their Bid envelopes using the name, address, identifying information and specification number, indicated in Document 00 1113 (Notice Inviting Bids).

2.03 Required Contents of "Envelope A – Bid Submittals"

- A. Document 00 4113 (Bid Form). Bidders must submit Bids on Document 00 4113 (Bid Form) in accordance with the provisions of Document 00 4113. Bidders must complete all Bid items and supply all information required by Bid documents and specifications.
- B. Document 00 4313 (Bond Accompanying Bid). Bidders must submit Document 00 4313 (Bond Accompanying Bid) accompanied by a cashier's check, certified check (certified without qualification and drawn on a solvent bank of the State of California or a National Bank doing business in the State of California) or completed form of Document 00 4313 of not less than 10% of the base Bid, payable to City and completed in accordance with the provisions of Document 00 4313.
- C. Document 00 4314 (Bidder Registration and Experience Form). Bidders must submit Document 00 4314 (Bidder Registration and Experience Form), completed in accordance with the provisions of Document 00 4314.
- D. Document 00 4330 (Subcontractor List). Bidders must submit Document 00 4330 (Subcontractors List) completed in accordance with the provisions of Document 00 4330. The Subcontractors List must include the names of all subcontractors for those subcontractors who will perform any portion of work, including labor, rendering of service, or specially fabricating and installing a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of the total Bid amount. Any violation of this requirement may result in a Bid being deemed non-responsive and not being considered.
- E. Document 00 4519 (Non-Collusion Affidavit). Bidders must submit Document 00 4519 (Non-Collusion Affidavit) completed in accordance with the provisions of Document 00 4519.
- F. Document 00 4546 (Bidder Certifications). Bidders must submit Document 00 4546 (Bidder Certification) completed in accordance with the provisions of Document 00 4546.

2.04 Required Contents of "Envelope B – Statement of Qualifications"

- A. Document 00 4513 (Statement of Qualifications for Construction Work). Bidder must submit Document 00 4513 (Statement of Qualifications for Construction Work) in accordance with the provisions of Document 00 4513.

ARTICLE 3 - BID OPENING AND EVALUATION**3.01** Determination of Apparent Low Bidder

- A. City will open each Bidders' Envelope A at the time and place indicated in Document 00 1113 (Notice Inviting Bids), initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein.

- B. Apparent Low Bid will be determined solely on the total amount of all Bid items based on terms contained in Document 00 1113 (Notice Inviting Bids) and Document 00 4113 (Bid Form). All Bidders are required to submit Bids on all Bid items (including any alternates).
- C. For the purposes of award, the apparent low Bidder will be the conforming responsible Bidder offering the lowest total amount for the Total Base Bid shown in the Bid Form. Once the low bidder is determined as herein described, the City reserves the right to award any combination of Additive Bid alternates, or not award any Additive Bid alternates, as it deems to be in the best interest of the City, regardless of whether the total bid of the particular combination selected is higher or lower than any other bidder for that same combination.
- D. For the Apparent Low Bidder only, City will open Envelope B and evaluate the Apparent Low Bidder for responsiveness to the requirements of Document 00 4513 and for Responsibility.
- E. If Apparent Low Bidder is determined to be non-responsive or non-responsible, then City may proceed to the next Apparent Low Bidder's Bid pursuant to any procedures determined in its reasonable discretion, and proceed for all purposes as if this Apparent Low Bidder were the original Apparent Low Bidder.

3.02 Evaluation of Bids

- A. Bids must be full, complete, clearly written and using the required forms. Bidders shall make any change in the Bid by crossing out the original entry, entering and initialing the new entry. Bidder's failure to submit all required documents strictly as required entitles City to reject the Bid as non-responsive. All Bidders must submit Bids containing each of the fully executed documents supplied in this Project Manual.
- B. In evaluating Bids, City will consider Bidders' qualifications, whether or not the Bids comply with the prescribed requirements, unit prices, and other data, as may be requested in Document 00 4113 (Bid Form) or prior to the Notice of Award.
- C. City may conduct reasonable investigations and reference checks of Bidder and other persons and organizations as City deems necessary to assist in the evaluation of any Bid and to establish Bidder's responsibility, qualifications, financial ability and ability to perform the Work in accordance with the Contract Documents to City's satisfaction within the prescribed time. Submission of a Bid constitutes Bidder's consent to the foregoing.
- D. City shall have the right to consider information provided by sources other than Bidder. City shall also have the right to communicate directly with Bidder's surety regarding Bidder's bonds.
- E. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.
- F. Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of City made as part of Bid evaluation process after submission of Bid.

3.03 Reservation of Rights

- A. City reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder as non-responsive as a result of any error or omission in the Bid, or if City believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by City. For purposes of this paragraph, an "unbalanced Bid" is one having nominal prices for some Bid items and enhanced prices for other Bid items.
- B. City may retain Bid securities and Bid bonds of other than the Apparent Low Bidder for a period of 90 Days after award or full execution of the Contract, whichever first occurs.
- C. City may reject any or all Bids and waive any informalities or minor irregularities in the Bids. City also reserves the right, in its discretion, to reject any or all Bids and to re-Bid the Project.

ARTICLE 4 - MANDATORY BID PROTEST PROCEDURES**4.01 Submission of Written Bid Protest**

- A. Any Bid protest in connection with the construction contract or work described in general in Document 00 1113 (Notice Inviting Bids) must be submitted in writing to the Project Manager as indicated in Document 00 1113, paragraph 1.03 before 3:30 p.m. of the fifth Business Day following opening of the Bidders' envelopes.
- B. The initial protest document must contain a complete statement of the basis for the protest.
- C. The protest must refer to the specific portion of the document that forms the basis for the protest.
- D. The protest must include the name, address, and telephone number of the person representing the protesting party.
- E. Only Bidders who the City otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, City may evaluate all information contained in any protesting Bidder's Bid, and conduct the same investigation and evaluation as City is entitled to take regarding an Apparent Low Bidder.
- F. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

4.02 Exclusive Remedy

- A. The procedure and time limits set forth in this paragraph are mandatory and are Bidder's sole and exclusive remedy in the event of Bid protest. Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.

ARTICLE 5 - AWARD AND EXECUTION OF CONTRACT**5.01 Notice of Intent to Award and Submittal of Executed Contract Documents**

- A. If Contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. City will issue Document 00 5100 Notice of Intent to Award. Such Award, if made, will be made within sixty (60) calendar days after the opening of the Bid Proposals.
- B. Successful Bidder must execute and submit to City the "Required Contract Documents and Proof of Insurance" set forth below, by 5:00 p.m. of the 10th calendar Day following the Notice of Intent to Award.

5.02 Required Contract Documents and Proof of Insurance

- A. Document 00 5200 (Agreement), fully executed by successful Bidder. Submit **two** originals and an emailed PDF, each bearing an original signature (in blue ink) and initials on each page.
- B. Document 00 6113.13 (Construction Performance Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.13. Submit **two** originals and an emailed PDF.
- C. Document 00 6113.16 (Construction Labor and Material Payment Bond), fully executed by successful Bidder and surety, in the amount set forth in Document 00 6113.16. Submit **two** originals and an emailed PDF.
- D. Document 00 6536 (Guaranty), fully executed by successful Bidder. Submit **two** originals and an emailed PDF.
- E. Insurance certificates and endorsements required by Document 00 7316 (Supplementary Conditions — Insurance and Indemnification): Submit **one** original set and an emailed PDF.
- F. Document 006580 (City Contracting Policies), fully executed by successful bidder. Submit **one** original set and an emailed PDF.

5.03 Failure to Execute and Deliver Documents:

- A. If Bidder to whom Contract is awarded, within the period described in this Document 00 2113, fails or neglects to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, City may, in its sole discretion, rescind the award, recover on Bidder's surety bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract Documents. Bidder agrees that calculating the damages City may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of City's damages.
- B. Upon such failure to timely deliver all required Contract Documents as set forth herein, City may determine the next Apparent Low Bidder and proceed accordingly. Such Award, if made, will be made within sixty (60) calendar days after the opening of the Bid Proposals.

ARTICLE 6 - GENERAL CONDITIONS AND REQUIREMENTS**6.01 Modification of Commencement of Work:**

- A. City expressly reserves the right to modify the date for the Commencement of Work under the Contract and to independently perform and complete work related to Project. City accepts no responsibility to Contractor for any delays attributed to its need to complete independent work at the Site.
- B. City shall have the right to communicate directly with Apparent Low Bidder's proposed performance bond surety, to confirm the performance bond. City may elect to extend the time to receive faithful performance and labor and material payment bonds.

6.02 Conformed Project Manual:

- A. Following Award of Contract, City may prepare a conformed Project Manual reflecting Addenda issued during bidding, which will, failing objection, constitute the approved Project Manual.

6.03 Payment Bond:

- A. If the Project described in Document 00 1113 (Notice Inviting Bids) involves an expenditure in excess of twenty-five thousand dollars (\$25,000), the successful Bidder must file a payment bond with and approved by City prior to entering upon the performance of the Work, in accordance with Civil Code § 3247.

6.04 Wage Rates:

- A. The successful Bidder must comply with all prevailing wage laws applicable to the Project, and related requirements contained in the Contract Documents. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at <http://www.dir.ca.gov/oprl/pwd/> and are deemed included in the Bidding Documents. The successful Bidder shall post the applicable prevailing wage rates at the Site.

6.05 Withdrawal of Bids:

- A. Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 00 2113, only by written request for the withdrawal of Bid filed with City's Purchasing Department, at 2180 Milvia Street, 3rd Floor, Berkeley, CA 94704. Bidder or its duly authorized representative shall execute request to withdraw Bid.

6.06 Ineligible Contractors and Subcontractors:

- A. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

- B. City shall not accept a Bid from a Bidder who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code section 1777.1 or 1777.7. Bidders and the Contractor who is awarded the project contract shall not utilize, or allow work by, any subcontractor who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code Section 1777.1 or 1777.7. (See California Public Contract Code Section 6109.) The California Division of Labor Standards Enforcement publishes a list of debarred contractors and subcontractors on the Internet at www.dir.ca.gov/DLSE/debar.html.

6.07 Substitutions:

- A. Bidders must base their Bids on products and systems specified in Contract Documents or listed by name in Addenda. City will consider substitution requests only for "or equal items." Bidders wanting to use "or equal" item(s) may submit Document 00 6325 (Substitution Request Form) no later than 35 calendar days after Notice of Award. As a limitation on Bidder's privilege to request substitution of "or equal" items, City has found that certain items are designated as City standards and certain items are designated to match existing items in use on a particular public improvement either completed or in the course of completion or are available from one source. As to such items, City will not permit substitution. Such items are described in the Bidding Documents.

6.08 Definitions:

- A. All abbreviations and definitions of terms used in this Document 00 2113 are set forth in Document 00 7200 (General Conditions) and Section 01 4200 (References and Definitions).

END OF SECTION

DOCUMENT 00 3132**GEOTECHNICAL DATA AND EXISTING CONDITIONS****ARTICLE 1 - REPORTS AND INFORMATION ON EXISTING CONDITIONS****1.01 Inspection of Reports:**

- A. City, its consultants, and prior contractors may have collected documents providing a general description of the Site and conditions of the Work. These documents may consist of geotechnical reports for and around the Site, contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding Underground Facilities (collectively, "Existing Conditions Data".)
- B. Bidders may inspect Geotechnical and Existing Conditions Data. These documents are listed in Section 01 1100 (Summary) and are available for review at the address identified therein. Copies may be obtained for the cost of reproduction and handling upon Bidder's payment for the costs.
- C. Existing Conditions Data is for information only and does not describe labor, materials or equipment furnished by Contractor, but rather, information regarding conditions of the work. Such Existing Conditions Data is not a Contract Document.

ARTICLE 2 - USE OF EXISTING CONDITIONS DATA**2.01 Above-Ground Existing Conditions:**

- A. City makes no warranty or representation of existing aboveground conditions, as-built conditions, or other aboveground actual conditions verifiable by reasonable independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform prior to bidding and Bidder must not rely on the information supplied by City regarding existing conditions.
- B. Bidder represents and agrees that in submitting its Bid, it is not relying on any information regarding above-ground existing conditions supplied by City.

2.02 Underground Facilities:

- A. Information supplied regarding existing Underground Facilities at or contiguous to the Site is based on information furnished to City by others (e.g., the builders of such Underground Facilities or others).
- B. City assumes responsibility for only the general accuracy, completeness or thoroughness of information regarding Underground Facilities that are owned by City. This express assumption of responsibility applies only if Bidder has conducted the independent investigation required of it under Document 00 7200 (General Conditions) and discrepancies were not apparent. Bidder is solely responsible for any interpretation or conclusion drawn from this information.
- C. City is not responsible for information regarding Underground Facilities owned by others.

2.03 Hazardous Materials Surveys:

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

2.04 Geotechnical Data:

- A. Bidder may rely upon the general accuracy of the "technical data" contained in the geotechnical reports and drawings identified above, but only insofar as it relates to subsurface conditions,

provided Bidder has conducted the independent investigation required of it and discrepancies were not apparent.

- B. The term "technical data" shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment, or structures that were encountered during subsurface exploration. The term "technical data" does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures. The term "technical data" shall not include the location of Underground Facilities.
- C. Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information contained in supplied geotechnical data.
- D. Except as expressly set forth in this Document 00 3132, City does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data.
- E. Bidder represents and agrees that in submitting its Bid, it is not relying on any geotechnical data supplied by City, except as specifically set forth herein.

ARTICLE 3 - INVESTIGATIONS

3.01 Required Investigations:

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

3.02 Access to Site for Investigations:

- A. During the Pre-Bid Site Visit(s), City will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. The Bidder may request alternate dates and times to access the site. Such request must be made in writing at least ten (10) calendar days prior to bid. Bidders must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 2113 (Instructions to Bidders) and Document 00 7200 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Bidder shall supply all equipment required to perform any investigations as each Bidder deems necessary. City has the right to limit the number of pieces of machinery operating at one time due to safety concerns.

END OF SECTION

DOCUMENT 00 4113**BID FORM****TO CITY OF BERKELEY**

THIS BID IS SUBMITTED BY:

(Firm/Company Name)

Re:Public Safety Building Jail Automation Upgrades at 2100 Martin Luther King Jr Way, Specification No. 25-11684-C

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with City of Berkeley in the form included in the Contract Documents, Document 00 5200 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Contract Documents, Document 00 1113 (Notice Inviting Bids), and Document 00 2113 (Instructions to Bidders), including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 calendar days after the day of Bid opening, unless there is a bid protest, then 90 calendar days after the day of bid opening. Bidder will sign and submit Document 00 5200 (Agreement) and other documents required by Document 002113, paragraph 5.02 (Required Contract Documents and Proof of Insurance) within 20 calendar days after receipt of City's Notice of Intent to Award.
3. In submitting this Bid, Bidder represents that Bidder has examined all of the Contract Documents, performed all necessary Pre-Bid investigations as set forth in Document 00 5200 (Agreement) Article 6 (Contractor's Representation), received the Pre-Bid conference minutes (if any), and received the following Addenda:

Addendum Number	ADDENDUM DATE	Signature of Bidder

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

SCHEDULE OF BID PRICES

All Bid items, including lump sums and unit prices, must be filled in completely. Bid items are described in Section 01 1100 (Summary of Work). Quote in figures only, unless words are specifically requested.

ITEM	DESCRIPTION	PRICE (\$)
1	All work of the Contract Documents other than work separately provided for under other bid items, i.e. excluding Bid Alternates item 1.	
	Total Bid Price: (Bid Item 1 through 1)	

Total Bid Price: (Bid Item 1 through 1)

(Words)

Bid Alternates

ITEM	DESCRIPTION	PRICE (\$)
1	Bid Alternate 1: Access controls, Intercoms, cabling, and conduit for Visitor Cell 1154, 1155, 1157	

5. Subcontractors for work included in all Bid items are listed on Document 00 4330 (Subcontractors List) submitted herewith.
6. The undersigned Bidder understands that City reserves the right to reject this Bid, but that this Bid shall remain open and shall not be withdrawn for a period of sixty (60) calendar days from the date prescribed for its opening.
7. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Intent to Award, is mailed or delivered to the undersigned Bidder within the time described in Paragraph 2 of this Document 00 4113 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Document 00 2113 (Instructions to Bidders) within the times specified therein.
8. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.
9. The undersigned Bidder herewith encloses cash, a cashier's check, or certified check of or on a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do a surety business in the State of California, in form specified in Document 00 2113 (Instructions to Bidders), in the amount of ten percent (10%) of the Total Bid Price and made payable to City of Berkeley.
10. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Document 00 7200 (General Conditions) and to complete all Work within the time specified in Document 00 5200 (Agreement).
11. The undersigned Bidder agrees that, in accordance with Document 00 7200 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Document 00 5200 (Agreement) shall be as set forth in Document 00 5200.

12. The names of all persons interested in the foregoing Bid as principals are:

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full.

NAME OF BIDDER: _____

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

_____	_____
(Place of Incorporation, if Applicable)	(Principal)
_____	_____
	(Principal)
_____	_____
	(Principal)

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

(Signature of Bidder)

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

Business Address: _____

Contractor's Representative(s): _____
(Name/Title)

(Name/Title)

(Name/Title)

Officers Authorized to Sign Contracts _____
(Name/Title)

(Name/Title)

(Name/Title)

Telephone Number(s):

(Area Code)

(Number)

(Area Code)

(Number)

Fax Number(s):

(Area Code)

(Number)

(Area Code)

(Number)

Date of Bid:

END OF SECTION

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DOCUMENT 00 4313
BOND ACCOMPANYING BID

KNOW ALL BY THESE PRESENTS:

That the undersigned

(Name of Contractor)

as Principal and the undersigned as Surety are held and firmly bound unto City of Berkeley,
as obligee, in the penal sum of _____

(Dollar Amount in Words)

Dollars (\$_____) lawful money of the United States of America being at least ten
percent (10%) of the aggregate amount of said Principal

_____’s base Bid, for the payment of which,
well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns,
jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a Bid for

Specification No. 25-11684-C
Public Safety Building Jail Automation Upgrades
at 2100 Martin Luther King Jr Way.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Bid submitted by the said Principal
be accepted and the Contract be awarded to said Principal and said Principal shall within the required
periods enter into the Contract so awarded and provide the required Construction Performance Bond,
Construction Labor and Material Payment Bond, insurance certificates, Guarantee, and all other
endorsements, forms, and documents required under Document 00 2113 (Instructions to Bidders), then
this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument this _____
day of _____, 20____.
(Month)

(Corporate Seal)

By _____
Principal

By _____
Surety

(Corporate Seal)

By _____
Attorney in Fact

END OF SECTION

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DOCUMENT 00 4314
BIDDER REGISTRATION FORM
INSTRUCTIONS

In order to register to undertake work for City of Berkeley, Bidder **must**:

- 1) Fill out this registration form completely; do not leave blanks.
- 2) Provide certificates of insurance or a letter evidencing coverage complying with Document 00 4513 (Statement of Qualifications).

INDEPENDENT CONTRACTOR REGISTRATION

Contractor's License # _____

Date: _____ Fed I.D. # _____

Full Corporate Name of Company: _____

Street Address: _____

Mailing Address: _____

Phone: _____ Fax: _____

Name of Principal Contact: _____

Type of Business: _____ Sole Proprietor _____ Partnership
 _____ Non-Profit 501(c)(3) _____ Corporation
 _____ other (please explain: _____)

INSURANCE

Workers' Compensation:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

General Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: \$ _____

A.M. Best Rating: _____

Automobile Liability:

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: \$ _____

A.M. Best Rating: _____

All-risk Course of Construction (if applicable, as required by Document 00 7316 [Supplementary Conditions – Insurance]):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: \$ _____

A.M. Best Rating: _____

Professional Liability (if applicable, as required by Document 00 7316 [Supplementary Conditions – Insurance]):

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: \$ _____

A.M. Best Rating: _____

**Pollution Legal Liability Insurance (if applicable, as required by Document 00 7316
[Supplementary Conditions – Insurance]):**

Carrier: _____

Address: _____

Phone and Fax: _____

Policy Number: _____

Policy Limits: \$ _____

A.M. Best Rating: _____

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

SIGNATURE

DATE

SAFETY EXPERIENCE

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

1. List Bidder's interstate Experience Modification Rate for the last three years.
[20__] ____ **[20__]** ____ **[20__]** ____
2. Use Bidder's last year's Cal/OSHA 300 log to fill in the following number of injuries and illnesses:
 - a. Number of lost workday cases _____
 - b. Number of medical treatment cases _____
 - c. Number of fatalities _____
3. Employee hours worked last year _____
4. State the name of Bidder's safety engineer/manager: _____

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

I CERTIFY, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND I AUTHORIZE OWNER, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

BIDDER:

By: _____
Signature

Its: _____
Title

Date _____

END OF SECTION

DOCUMENT 00 4330
SUBCONTRACTORS LIST

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

Full Name of Subcontractor (Sub.) and Address of Mill or Shop	Sub.'s License No.	Description of Work: Reference to Bid Items	Sub.'s Bid Amount	Sub.'s Depart. Of Industrial Relations No.

(Bidder to attach additional sheets if necessary)

END OF SECTION

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DOCUMENT 00 4513
STATEMENT OF QUALIFICATIONS FOR CONSTRUCTION PROJECTS

ARTICLE 1 – GENERAL INFORMATION**1.01 Minimum Bidder Qualifications.**

- A. Bidders must be duly licensed in accordance with the California Business & Professions Code and have a history of work performance sufficient to meet the requirements of a responsible bidder in the California Public Contract Code Section 1104.
- B. Bidders must have three (3) years experience as a continuously operating entity engaged in the performance of similar work.
- C. Bidders must demonstrate successful experience with type of work of this Project, to include, within the past year, completed two (2) projects of a similar nature and complexity with a contract dollar amount of (i.) at least 75% of the amount of Bidder's Bid or (ii.) 125% of such amount in the aggregate.

1.02 Measurement.

- A. Bidder's compliance with the minimum qualification requirements will be measured by Bidder's experience as an operating entity and also by the experience of the supervisory personnel who will have responsible charge of the various major components of the Work.
- B. If Bidder subcontracts portions of the Work, City, in its determination of whether the minimum qualification requirements have been met, may consider the qualifications of the Subcontractor's supervisory personnel.
- C. The qualifications of the Key Personnel are to be submitted with the Statement of Qualifications ("SOQ"), by providing the information described in this Document 00 4513.

ARTICLE 2 – Required Contents of SOQ Submission**2.01 Transmittal Letter**

- A. The Transmittal Letter shall name the proposed prime contractor, its legal structure (i.e., corporation, partnership, limited partnership, joint venture). If a joint venture or partnership is proposed, Bidder shall identify partner and/or member of the joint venture and their roles and responsibilities.

2.02 Submittals:

- A. Completed Questionnaire. Bidder shall include a completed Statement of Qualification Questionnaire in the form attached to this Document 00 4513 as Attachment "A".
- B. License: Evidence of a valid contractor's license and required licenses of all licensees of persons who are Key Personnel necessary to perform the Work.
- C. Litigation History. Description of litigation history for the past three years, including names of involved parties, nature of dispute, and disposition.

2.03 Additional Submittals:

After bid opening, Contractor maybe required to supply the City with the following submittals upon request.

- A. Resumes of Proposed Key Personnel. Bidder shall provide a resume for each named Key Personnel of Bidder, to include as necessary: Years of experience; Education - degrees, schools and years obtained; Professional Registrations; Fluency in English (Yes/No); At least two client references, including contact names, addresses and telephone numbers, and description of projects of a similar nature worked on in the past five years.
- B. Audited or Reviewed Financial Statements. Include audited or reviewed financial statements for the three most recently completed fiscal years for Bidder and each member of any proposed

consorting or joint venture. Also include audited or reviewed financial statements for the three most recently completed fiscal years for any parent companies) of Bidder and each member of any proposed consortium or joint venture.

- C. Surety Letter re: Capability to Provide Required Performance and Payment Bonds. Bidder shall include a letter from a surety duly licensed to do business in the State of California, having a financial rating from A.M. Best Company of A-, VIII or better, that the surety has agreed to provide Bidder with the required performance and payment bonds in accordance with the requirements set forth in Documents 00 6113.13 (Construction Performance Bond) and 00 6113.16 (Construction Labor and material Payment bond), each in the penal sum of the Contractor's bid when submitted. Owner shall have the right to verify with the surety that the surety, based upon the Bid prices, will issue the required bonds under the conditions stated.
- D. Insurer Letter re: Capability to Provide the Required Insurance. Bidder shall provide a letter from an insurance underwriter, having a financial rating reasonably acceptable to City, confirming that the insurer will provide Bidder the required coverages and amounts specified in the Contract Documents.
- E. Description of Human and Physical Resources. Bidder shall identify, describe, and quantify for itself, the following technical information for the construction work: Description and location of manufacturing facilities, naming products and quantifying production capacity and current demand; Description of field organization(s), naming skills and equipment; Description of safety program quality control procedures, and safety experience.

2.04 Format.

- A. The SOQ shall be clear and concise to enable management-oriented personnel to make a thorough evaluation and arrive at a sound determination as to whether the SOQ meet City's requirement. To this end, the SOQ should be so specific, detailed and complete as to demonstrate clearly and fully that the Bidder has a thorough understanding of and has demonstrated knowledge of the requirements to perform the Work (or applicable portion thereof).
- B. Any explanation requested by a Bidder regarding the meaning or interpretation of this Document 00 4513 must be requested in writing and with sufficient time allowed for a reply to reach Bidder before the submission of its SOQ. Oral explanations or instructions will not be binding. Any information provided to any prospective Bidder concerning this Document 00 4513 will be furnished to all prospective Bidders as an Addendum to the Bidding Documents.

STATEMENT OF QUALIFICATION QUESTIONNAIRE FOLLOWS ON NEXT PAGE

ATTACHMENT "A" – STATEMENT OF QUALIFICATION QUESTIONNAIRE

Bidders shall complete the entire Statement of Qualification Questionnaire and submit it in accordance with Document 00 2113 (Instructions to Bidders) and Document 00 4513 (Statement of Qualifications). Failure to complete the questionnaire or inclusion of any false statement(s) shall be ground for immediate disqualification.

CONTACT INFORMATION

Company Name: _____

Owner of Company: _____

Contact Person: _____

Address: _____

Phone: _____ Fax: _____

PART A: GENERAL INFORMATION

1. Does Bidder possess a valid and current California Contractor's license for the work proposed? Yes ___ No ___
2. Does Bidder have a minimum of **\$2,000,000** liability insurance coverage? Yes ___ No ___
3. Has Bidder's License been revoked at any time in the last five years? Yes ___ No ___
4. Has Bidder been "default terminated" by an Owner (other than for convenience), or has a Surety completed a contract for Bidder within the last five years? Yes ___ No ___
5. Has Bidder been convicted more than twice for failure to pay prevailing wages in the last three years? Yes ___ No ___
6. Will Bidder provide copies of its reviewed or audited financial statements and accompanying notes for the last three years, if requested? Yes ___ No ___

Bidder may be disqualified if any answer to questions 1, 2, or 6 is No.
Bidder may be disqualified if any answer to questions 3, 4, or 5 is Yes.

PART B: SAFETY, PREVAILING WAGE, DISPUTES AND BONDS**(SAFETY)**

1. Has Cal/OHSA, Federal OSHA, the EPA or any Air Quality Management Owner cited Bidder in the past five years?
Yes ___ No ___ If yes, attach description of each citation.
2. How often does Bidder require documented safety meetings be held for:

Field Supervisor	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
Employees	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
New Hires	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
Subcontractors	Weekly _____	Bi-Weekly _____	Monthly _____	Less Than Monthly _____
3. How often does Bidder conduct documented safety inspections?
Quarterly _____ Semi-annually _____ Annually _____ Other _____

4. Does Bidder have home office safety representatives who visit/audit the job site?
Quarterly _____ Semi-annually _____ Annually _____ Other _____
5. What is Bidder's Interstate Experience Modification Rate? _____. (A rating in excess of **[1]** may constitute grounds for disqualification as non-responsible).

(PREVAILING WAGE PROVISIONS)

6. Has Bidder been fined, penalized or otherwise found to have violated any prevailing wage or labor code provision? If yes, attach description of each occurrence.
Yes _____ No _____

(LICENSE PROVISIONS)

7. Has Bidder changed names or license numbers in the past 5 years? If so, please state reason for change.
Yes _____ No _____ Reason: _____

(DISPUTES)

8. Has Bidder had any claims, litigation, or disputes ending in mediation or arbitration, or termination for cause associated with any project in the past 5 years? If yes, attach description of each instance including details of total claim amount, settlement amount, and Owner's name and phone number.
Yes _____ No _____

(BONDING)

9. Bonding Capacity – Provide documentation from Bidder's surety identifying the following:
Name of bonding company/surety: _____
Name of Surety Agent: _____
Surety Agent address: _____
Surety Agent phone number: _____
Is surety a California-admitted surety? Yes _____ No _____
Is surety listed in the current edition of the California Department of the Treasury's Listing of approved sureties? Yes _____ No _____
List surety's A.M. Best Rating: _____
What is Bidder's total bonding capacity? _____
What percent does Bidder pay for bonds? _____

PART C: EXPERIENCE OF PRIME CONTRACTOR

The nature of this Project requires prior similar experience for the firm and the Key Personnel assigned. Summarize similar project experience below and provide the detailed project information requested:

Prime Contractor. List three projects of similar size and scope to the Work of the Contract, completed in the past two (2) years, and indicate who were the superintendent, project manager and scheduler.

NOTE: this listing will be used to assess compliance with the stated minimum qualifications in Section 1.01.

Project Name	Construction Cost (\$)	Year Completed	Name of Project Superintendent	Name of Project Manager	Name of Project Scheduler

List Key Personnel that will be assigned to the Work of the current Project and their experience/training with the projects listed above:

Project Manager: _____

Project Superintendent: _____

Project Scheduler: _____

Recent Projects.

Provide information about three (3) of its most currently completed projects. Names and references must be current and verifiable. This listing will be used to assess compliance with the stated minimum qualifications in Section 1.01. If a separate sheet is used, it must contain all of the following information:

1. Project Name: _____
Location: _____
Owner: _____
Owner Contact (name and phone): _____
Architect/Engineer: _____
Architect/Engineer Contact (name and phone number): _____
Const. Mgr. or Project Mgr. (name and phone number): _____
Description of Project, Scope of Work Performed: _____

Total Construction Cost: _____
Total Change Order Amount: _____
Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.
Original Scheduled Date of Completion: _____
Time Extensions Granted (number of calendar days): _____
Actual Date of Completion: _____
Number of Stop Notices filed by Subcontractors or Suppliers: _____
2. Project Name: _____
Location: _____
Owner: _____
Owner Contact (name and phone): _____
Architect/Engineer: _____
Architect/Engineer Contact (name and phone number): _____
Const. Mgr. or Project Mgr. (name and phone number): _____
Description of Project, Scope of Work Performed: _____

Total Construction Cost: _____

Total Change Order Amount: _____

Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of calendar days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

3. Project Name: _____

Location: _____

Owner: _____

Owner Contact (name and phone): _____

Architect/Engineer: _____

Architect/Engineer Contact (name and phone number): _____

Const. Mgr. or Project Mgr. (name and phone number): _____

Description of Project, Scope of Work Performed: _____

Total Construction Cost: _____

Total Change Order Amount: _____

Did Change Orders exceed 10% of original contract sum? _____ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _____

Time Extensions Granted (number of calendar days): _____

Actual Date of Completion: _____

Number of Stop Notices filed by Subcontractors or Suppliers: _____

PART D: FINANCIAL INFORMATION

1. Has Bidder ever reorganized under the protection of bankruptcy laws?
Yes _____ No _____ If yes, please state when _____
2. If Bidder has had the general liability carrier identified in Document 00 4314 (Bidder Registration and Safety Experience Form) for less than 5 years, please provide additional information below for balance of the last 5 years:

Agency Name: _____

Contact Name: _____

Phone Number _____

Carrier: _____ A.M. Best Rating: _____

Carrier: _____ A.M. Best Rating: _____

Carrier: _____ A.M. Best Rating: _____
3. Has Bidder ever had insurance terminated by a carrier? Yes _____ No _____
If yes, explain on a separate signed sheet marked with correlating cross-reference to this paragraph of the questionnaire.

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

SIGNATURE

TITLE

END OF SECTION

DOCUMENT 00 4519
NON-COLLUSION AFFIDAVIT

PUBLIC CONTRACT CODE §7106

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

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

_____, being first duly sworn,
(Name of Principal of Bidder)

deposes and says that he or she is _____
(Office of Affiant)

of _____, the party
(Name of Bidder)

making the foregoing Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham Bid, and has not directly or indirectly colluded, conspired, connived or agreed with any bidder or anyone else to put in a sham Bid, or that anyone shall refrain from bidding, and that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the Bid price of Bidder or any other bidder, or to fix any overhead, profit or cost element of the Bid price, or of that of any other bidder, or to secure any advantage against City, or anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that Bidder has not, directly or indirectly, submitted its Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, Bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

Executed under penalty of perjury under the laws of the State of California:

(Name of Bidder)

(Signature of Principal)

Subscribed and sworn before me

This _____ day of _____, 20_____

Notary Public of the State of

In and for the County of _____

My Commission expires _____ (Seal)

- NOTE:** If Bidder is a partnership or a joint venture, this affidavit must be signed and sworn to by every member of the partnership or venture.
- NOTE:** If Bidder [including any partner or venturer of a partnership or joint venture] is a corporation, this affidavit must be signed by the Chairman, President, or Vice President and by the Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer.
- NOTE:** If Bidder's affidavit on this form is made outside the State of California, the official position of the person taking such affidavit shall be certified according to law.

END OF SECTION

DOCUMENT 00 4546**BIDDER CERTIFICATIONS**

TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to City as set forth in sections 1 through 5 below.

1. STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a Federal Court has been issued against Bidder within the past two years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

2. CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's 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.

3. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 1773 of the California Labor Code, which requires the payment of prevailing wage on public projects. Also, that the Contractor and any subcontractors under the Contractor shall comply with California Labor Code §1776, regarding wage records, and with California Labor Code §1777.5, regarding the employment and training of apprentices. It is the Contractor's responsibility to ensure compliance by any and all subcontractors performing work under this Contract.

4. CERTIFICATION OF COMPLIANCE WITH PUBLIC WORKS CHAPTER OF LABOR CODE

By my signature hereunder, as the Contractor, I certify that I am aware of Sections 1777.1 and 1777.7 of the California Labor Code and Contractor and Subcontractors and am eligible to bid and work on public works projects.

5. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that Owner will be relying on this certification if it awards the Contract to the undersigned.

BIDDER:_____
(Name of Bidder)

Date: _____, [20]

By: _____

(Signature)

Name: _____

(Print Name)

Its: _____

(Title)**END OF SECTION**

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DOCUMENT 00 5100**NOTICE OF INTENT TO AWARD**

Dated _____

TO: _____

ADDRESS: _____

CONTRACT NO.: _____

CONTRACT FOR: City of Berkeley
Public Safety Building Jail Automation Upgrades AT 2100 Martin Luther King Jr Way

The Contract Sum of your contract is XXX Million Dollars and No Cents (\$\$\$).

1. Two copies of the proposed Contract Documents listed below accompany this Notice of Award.
2. You must comply with the following conditions precedent by **5:00 p.m.** of the **20th Day** following the date of this Notice of Award, that is, by Day of Week, Month Day, Year.
 - a. Deliver to Owner **two** fully executed counterparts and an emailed PDF copy of Document 00 5200 (Agreement). Each copy of Document 00 5200 (Agreement) must bear your original signature on the signature page and your initials on each page.
 - b. Deliver to Owner **two** originals and an emailed PDF of Document 00 6113.13 (Construction Performance Bond), executed by you and your surety.
 - c. Deliver to Owner **two** originals and an emailed PDF of Document 00 6113.16 (Construction Labor and Material Payment Bond), executed by you and your surety.
 - d. Deliver to Owner **two** original copies and an emailed PDF of Document 00 6536 (Guaranty), each executed by you.
 - e. Deliver to Owner **one** original set and an emailed PDF of the insurance certificates with endorsements required under Document 00 7316 (Supplementary Conditions – Insurance).
 - f. Deliver to Owner **one** original copy and an emailed PDF of all documents found in Document 00 6580 (City of Berkeley Contracting Policies) executed by you.
3. Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.
4. Within 21 calendar days after you comply with the conditions in Paragraph 2 of this Document 00 5100, Owner will return to you one fully signed counterpart of Document 00 5200 (Agreement) with [number] copies of the Project Manual (including Specifications and Drawings) and [number] sets of full-size Drawings.
5. Before you may start any Work at the Site, you must attend a preconstruction conference. The preconstruction conference may be arranged through **Uriel Gonzalez (510) 981-6627**. Questions regarding

bonds and insurance and all other inquiries regarding the Project may be directed to **Uriel Gonzalez** at the same number.

6. Upon commencement of the Work, you and each of your Subcontractors shall certify and provide Owner copies of payroll records on forms provided by the Division of Labor Standards Enforcement, in accordance with California Labor Code §1776.

OWNER

BY: _____
(Title)

(Print Name)

ATTEST: _____
Secretary

(Print Name)

AUTHORIZED BY **[CITY / COUNTY / DISTRICT]** RESOLUTION:

NO: _____

ADOPTED: _____, [20__]

[Copy of Resolution Attached]

END OF DOCUMENT

DOCUMENT 00 5200**AGREEMENT**

THIS AGREEMENT, dated this [date] day of [Month], [20__], by and between [Contractor Name] whose place of business is located at [Contractor Address] ("Contractor"), and City of Berkeley ("City"), acting under and by virtue of the authority vested in Owner by the laws of the State of California.

SPECIFICATION NUMBER 25-11684-C

**Public Safety Building Jail Automation Upgrades
at
2100 Martin Luther King Jr Way**

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

ARTICLE 1 – SCOPE OF WORK OF THE CONTRACT**1.01 WORK OF THE CONTRACT**

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

1.02 PRICE FOR COMPLETION OF THE WORK

- A. City shall pay Contractor the following Contract Sum \$\$\$ for completion of Work in accordance with Contract Documents as follows: [LUMP SUM]
- B. The Contract Sum includes all allowances (if any).

ARTICLE 2 – COMMENCEMENT AND COMPLETION OF WORK**2.01 COMMENCEMENT OF WORK**

- A. Contractor shall commence Work on the date established in the Notice to Proceed (**Commencement Date**).
- B. City reserves the right to modify or alter the Commencement Date.

2.02 COMPLETION OF WORK

- A. Contractor shall achieve Substantial Completion of the entire Work within **119** calendar days from the Commencement Date.
- B. Contractor shall achieve Final Completion of the entire Work **133** calendar days from the Commencement Date.

ARTICLE 3 – PROJECT REPRESENTATIVES**3.01 CITY'S PROJECT MANAGER**

- A. City has designated Uriel Gonzalez as its Project Manager to act as City's Representative in all matters relating to the Contract Documents.
- B. Project Manager shall have final authority over all matters pertaining to the Contract Documents and shall have sole authority to modify the Contract Documents on behalf of City, to accept work, and to make decisions or actions binding on City, and shall have sole signature authority on behalf of City.

- C. City may assign all or part of the Project Manager's rights, responsibilities and duties to a Construction Manager, or other City Representative.

3.02 CONTRACTOR'S PROJECT MANAGER

- A. Contractor has designated [_____ or other] as its Project Manager to act as Contractor's Representative in all matters relating to the Contract Documents.

3.03 ARCHITECT/ENGINEER

- A. **Noll & Tam Architects** furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.
- B. Architect/Engineer has designated **Tom Beil** as its project manager, to act as its representative for receiving and making communications authorized under the Contract Documents.

ARTICLE 4 – LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK

4.01 LIQUIDATED DAMAGE AMOUNTS

- A. As liquidated damages for delay, Contractor shall pay City Three Thousand Six Hundred dollars (\$3,600.00) for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.
- B. As liquidated damages for delay, Contractor shall pay City Three Thousand Six Hundred dollars (\$3,600.00) for each Day that expires after the time specified herein for Contractor to achieve Final Completion of the entire Work, until achieved.

4.02 SCOPE OF LIQUIDATED DAMAGES

- A. Measures of liquidated damages shall apply cumulatively.
- B. Limitations and stipulations regarding liquidated damages are set forth in Document 00 7200 (General Conditions).

ARTICLE 5 – CONTRACT DOCUMENTS

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

Document 00 5100	Notice of Award
Document 00 5200	Agreement
Document 00 5500	Notice to Proceed
Document 00 6113.13	Construction Performance Bond
Document 00 6113.16	Construction Labor and Material Payment Bond
Document 00 6536	Guaranty
Document 00 6530	Release of Claims
Document 00 6325	Substitution Request Form
Document 00 6290	Escrow Agreement for Security Deposits
Document 00 6580	City of Berkeley Contracting Policies
Document 00 7200	General Conditions
Document 00 7201	Supplementary Conditions
Document 00 7316	Supplementary Conditions – Insurance
Document 00 7317	Supplemental Conditions – Contracting Policies
Document 00 7319	Supplemental Conditions – Hazardous Materials
Document 00 7380	Apprenticeship Programs
Document 00 9113	Addenda

Specifications Divisions 1 through 9
 Maps, Drawings and Sketches listed in Document 00 0115

- 5.02** There are no Contract Documents other than those listed above. The Contract Documents may only be amended, modified or supplemented as provided in Document 00 7200 (General Conditions).

ARTICLE 6 – CONTRACTOR’S REPRESENTATIONS

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

- 6.01** Contractor has visited the site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.
- 6.02** Contractor has examined thoroughly and understood all reports of exploration and tests of subsurface conditions, as-built drawings, drawings or reports, available for Bidding purposes, of physical conditions, including Underground Facilities, identified in the Bid Documents, or which may appear in the Drawings, and accepts the determination set forth in these documents and Document 00 7200 General Conditions of the limited extent of the information contained in such reports and drawings upon which the Contractor may be entitled to rely. Contractor agrees that except for the information so identified, Contractor does not and shall not rely on any other information contained in such reports and drawings.
- 6.03** Contractor has conducted or obtained and has understood all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Article 6.02 above) which pertain to the subsurface conditions, as-built conditions, Underground Facilities and all other physical conditions at or contiguous to the site or otherwise which may affect the cost, progress, performance or furnishing of Work, as Contractor considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, test, reports, studies or similar information or data are or will be required by Contractor for such purposes.
- 6.04** Contractor has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 6.05** Contractor has given the Project Manager prompt written notice of all conflicts, errors, ambiguities or discrepancies that it has discovered in or among the Contract Documents and as-built and actual conditions and the written resolution thereof through Addenda issued by Project Manager is acceptable to Contractor.

ARTICLE 7 – MISCELLANEOUS

- 7.01** Terms and abbreviations used in this Agreement are defined in Document 00 7200 (General Conditions) and Section 01 4200 (References and Definitions) and will have the meaning indicated therein.
- 7.02** It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of City or acting as an employee, agent, or representative of City, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of City is limited and confined to such liability as

authorized or imposed by the Contract Documents or applicable law.

- 7.03** In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with §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 City tenders final payment to Contractor, without further acknowledgment by the parties.
- 7.04** Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at Owner's Office, and shall be made available to any interested party on request. Pursuant to California Labor Code §§ 1860 and 1861, in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of compensation to his employees. Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.
- 7.05** No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
- No contractor or subcontractor may be awarded a contract for public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.
- 7.06** This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Alameda, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the County of Alameda.

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

CITY OF BERKELEY

[CONTRACTOR NAME]

By: _____
City Manager

By: _____
(Signature)

(Print Name)

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

Attest:
CITY OF BERKELEY

City Clerk

By: _____
(Signature)

(Print Name)

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

Pre-approved as to form:
CITY ATTORNEY
8/2016

END OF DOCUMENT

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DOCUMENT 00 5500**NOTICE TO PROCEED**

Dated: _____, 20__

To: _____
(Contractor)Address: _____
_____CONTRACT FOR: **City of Berkeley Public Safety Building Jail Automation Upgrades AT 2100
Martin Luther King Jr Way**

CONTRACT NO: XXXXXX

You are notified that the Contract Time under the above Contract will commence to run on _____ [20__]. On that date, you are to start performing your obligations with respect to Work at the Site under the Contract Documents. In accordance with Article 2 of Document 00 5200 (Agreement), the dates of Substantial Completion and Final Completion for the entire Work are _____, [20__] and _____, [20__], respectively.

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

1. Submit certified Safety Program and related information
2. Submit copies of applicable permits
3. Submit approved fire protection plan, if applicable
4. Submit long-lead items submittals
5. Schedule of values submittal
6. Schedule
7. Agreements to Be Bound for all trades

OWNER

By: _____

Its: _____

END OF DOCUMENT

DOCUMENT 00 6113.13**CONSTRUCTION PERFORMANCE BOND**

KNOW ALL PERSONS BY THESE PRESENTS:

1.01 THAT WHEREAS, **City of Berkeley** ("City"), a public agency of the State of California, has awarded to **[Contractor Name]** as Principal, Specification Number **25-11684-C**, dated the _____ day of _____, 20____ (the "Contract"), titled Public Safety Building Jail Automation Upgrades in the amount of **\$\$\$**, which Contract is by this reference made a part hereof, for the work of the following Contract:

(Describe Contract Work)

1.02 AND WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

1.03 NOW, THEREFORE, we, the undersigned Principal and (Name of Surety) as Surety are held and firmly bound unto City in the sum of 100% OF THE CONTRACT PRICE to be paid to City or its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

1.04 THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by City, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by City, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless City as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

1.05 No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, or work or actions by City to mitigate the damages resulting from any breach in performance by Contractor, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

1.06 Whenever Principal shall be and declared by City in default under the Contract, Surety shall promptly remedy the default, or shall promptly, and in no event later than thirty (30) calendar days from notice:

- A. Undertake through its agents or independent contractors (but having qualifications and experience reasonably acceptable to City, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, indemnities, and the payment of liquidated damages; or
- B. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by City of the lowest responsible bidder, arrange for a contract between such bidder and City and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in

any event, Surety's total obligations hereunder shall not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by City to the Principal under the Contract and any amendments thereto, less the amount paid by City to Principal.

- 1.07** Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing City's rights against the others.
- 1.08** Surety may not use Contractor to complete the Contract absent City's Consent. City shall have the right in its sole discretion to continue the work of the Contract, as necessary following a default and/or termination, as necessary to prevent risks of personal injury, property damage or delay to the Project.
- 1.09** No right of action shall accrue on this bond to or for the use of any person or corporation other than City or its successors or assigns.
- 1.10** Surety shall join in any proceedings brought under the Contract upon City's demand, and shall be bound by any judgment.
- 1.11** Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____,
20____.

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____

Name and Title: _____

Address: _____

_____**SURETY**

Company: _____ (Corp. Seal)

Signature: _____

Name and Title: _____

Address: _____

_____**END OF DOCUMENT**

DOCUMENT 00 6113.16**CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND**

KNOW ALL PERSONS BY THESE PRESENTS:

- 1.01** THAT WHEREAS, City of Berkeley ("City") has awarded to [Contractor Name] as Principal, Specification No. **25-11684-C** dated the _____ day of _____, 20____ (the "Contract"), titled Public Safety Building Jail Automation Upgrades in the amount of **\$\$\$**, which Contract is by this reference made a part hereof, for the work of the following Contract:

(Describe Contract Work)

- 1.02** AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;
- 1.03** NOW, THEREFORE, we, the undersigned Principal and (Name of Surety), as Surety, are held and firmly bound unto City in the sum of 100% OF THE CONTRACT PRICE (**\$** _____), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.
- 1.04** THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its executors, administrators, successors, or assigns approved by City, or its subcontractors shall fail to pay any of the persons named in California Civil Code §3181, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, plus reasonable attorneys' fees, otherwise the above obligation shall become and be null and void.
- 1.05** This bond shall inure to the benefit of any of the persons named in California Civil Code §3181, as to give a right of action to such persons or their assigns in any suit brought upon this bond. The intent of this bond is to comply with the California Mechanic's Lien Law.
- 1.06** Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.
- 1.07** Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing Owner's rights against the other.
- 1.08** Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this ____ day of _____,
20____.

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature

Name

Title

Street Address

City, State, Zip Code

SURETY

Company: (Corp. Seal)

Signature

Name

Title

Street Address

City, State, Zip Code

END OF DOCUMENT

DOCUMENT 00 6290**ESCROW AGREEMENT FOR SECURITY DEPOSIT IN LIEU OF RETENTION**

California Public Contract Code §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this ____ day of _____, 20____, by and between City of Berkeley ("City"), whose address is 2180 Milvia Street, Berkeley, California 94704, **[Contractor Name]** ("Contractor"), whose place of business is located at **[Contractor Address]** and _____ (**Name**), as escrow agent **OR [] (Name of Bank)** _____, a state or federally chartered bank in the State of California, whose place of business is located at _____ ("Escrow Agent").

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

1. Pursuant to California Public Contract Code §22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by City pursuant to Contract Number _____ entered into between City and Contractor for Public Safety Building Jail Automation Upgrades located at **2100 Martin Luther King Jr Way** in the amount of **\$\$\$** dated _____, 20____ (the "Contract"). Alternatively, on written request of Contractor, City shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify City within ten calendar days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between Owner and Contractor. Securities shall be held in name of _____, and shall designate Contractor as the beneficial owner.
2. City shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in Paragraph 1 of this Document 00 6290.
3. When City makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when City pays Escrow Agent directly.
4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of City. Such expenses and payment terms shall be determined by Owner, Contractor, and Escrow Agent.
5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to City.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from City to Escrow Agent that City consents to withdrawal of amount sought to be withdrawn by Contractor.
7. City shall have the right to draw upon the securities in event of default by Contractor. Upon seven (7) calendar days written notice to Escrow Agent from City of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by City.
8. Upon receipt of written notification from City certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees

and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. Escrow Agent shall rely on written notifications from City and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Document 00 6290 and City and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.
10. Names of persons who are authorized to give written notice or to receive written notice on behalf of City and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

ON BEHALF OF CITY:

Title

Name

Signature

Address

City/State/Zip Code

ON BEHALF OF CONTRACTOR:

Title

Name

Signature

Address

City/State/Zip Code

ON BEHALF OF ESCROW AGENT:

Title

Name

Signature

Address

City/State/Zip Code

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

CITY

Title

Name

Signature

CONTRACTOR

Title

Name

Signature

ATTEST

Signature

Print Name

City Clerk

ESCROW AGENT

Title

Print Name

Signature

Pre-approved as to form:
CITY ATTORNEY
8/2016

At the time the Escrow Account is opened, City and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 00 6290.

END OF DOCUMENT

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DOCUMENT 00 6325**SUBSTITUTION REQUEST FORM**

To: [_____, Project Manager, City of Berkeley]

[(____) ____-____]

PROJECT:	Contractor:
City's Specification No. :	

Substitution Request By:	Firm:

Transmittal Record	Attn:	Firm:	Date Sent:	Date Rec'd:	Date Due:
Contractor to City					
Contractor to Architect					
City / Architect to Consultant					
Architect to City Representative					
City Representative to Contractor					

We hereby submit for your consideration the following product instead of the specified item for the Project:

Section / Drawing	Article	Specified Item
Proposed Substitution:		

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

Contractor to complete questions that follow and certifies to the accuracy of all answers:

A.	Does the substitution affect dimensions shown on Drawings? Yes ___ / No ___. If No, please explain proposed mitigation and why substitution is equivalent to originally specified item:
B.	Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes ___ / No ___. If No, please state reasons explain why substitution is equivalent to originally specified item:
C.	What effect does the substitution have on other trades? No effect: ___ / Some effect ___. If substitution will affect other trades, please explain the effect and why substitution is equivalent to originally specified item:
D.	Will substitution cause change to Project Schedule, or to critical delivery dates? Add? Shorten? If the substitution will add to schedule dates or affect critical activities, please explain why substitution is equivalent to originally specified item:
E.	Please describe differences between proposed substitution and specified item? Please explain and identify any and all differences, and please explain why substitution is equivalent to originally specified item:
F.	What is the Cost Differential to Contractor in original specified item and proposed substitution including all mark-ups? [If substitution requested during bid period, skip this question.]
G.	Are Manufacturer's guarantees for the proposed item the same as for item specified? Yes ____; No _____. If No, please explain why substitution is equivalent to originally specified item:

H.	Contractor accepts full responsibility for delays caused by redesign of other items of the Work necessitated by substitution? Yes ___ / No ___. If No, please state reasons and explain why substitution is equivalent to originally specified item:
I.	Contractor states that the function, appearance and quality are equivalent or superior to the specified item? Yes ___ / No ___. If No, please explain why substitution is equivalent to originally specified item:

We certify that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item, except as we may specifically state otherwise in this request.

Submitted by: _____ Signature: _____

Firm: _____ Date: _____

Address: _____ Phone/ Fax: _____

Remarks: _____

**Consultant
Response:**

- ☐ Accepted
- ☐ Not Accepted
- ☐ Accepted As Noted
- ☐ Received Too Late

Remarks: _____

By: _____

**City Representative
Response:**

- ☐ Accepted
- ☐ Not Accepted
- ☐ Accepted As Noted
- ☐ Received Too Late

Remarks: _____

By: _____

END OF DOCUMENT

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DOCUMENT 00 6530**AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS****[Public Contract Code § 7100]**

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS ("Agreement and Release"), made and entered into this _____ day of _____, 20____, by and between City of Berkeley ("City"), and **[Contractor Name]**("Contractor"), whose place of business is at **[Contractor Address]**.

RECITALS

- A. City and Contractor entered into Contract Number **XXXXXX** (the "Contract") for construction of City **Public Safety Building Jail Automation Upgrades** located at **2100 Martin Luther King Jr Way**, California.
- B. The Work under the Contract has been completed.

AGREEMENT

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

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

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

- 2. Subject to the provisions of this Agreement and Release, Owner will forthwith pay to Contractor the sum of [XXX Million Dollars and No Cents (\$\$\$\$)] under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with City as of the date of such payment.
- 3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against City arising from the Contract, except for the claims described in Paragraph 4 of this Document 00 6530. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against City, and all if its agents, employees, consultants, inspectors, representatives, assignees and transferees, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in Paragraph 6 of this Document 00 6530.
- 4. The following claims submitted under Document 00 7200 (General Conditions), Article 12, are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release.

[Insert information in Chart below, affix attachment if necessary]

CLAIM NO.	DATE SUBMITTED	DESCRIPTION OF CLAIM	AMOUNT OF CLAIM

5. Consistent with California Public Contract Code §7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 of this Document 00 6530, Contractor hereby releases and forever discharges City, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.
6. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.
7. Contractor shall immediately defend, indemnify and hold harmless City, any of the City's Representatives, Project Manager, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in Paragraph 4 of this Document 00 6530.
8. Contractor hereby waives the provisions of California Civil Code §1542, which provide as follows:

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

9. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal or other law, ruling, or regulation, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.
10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.
11. All rights of City shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

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

CITY

By: _____
Signature

Name: _____
Print

Its: _____
Title

ATTEST:

Title

Print

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

[CONTRACTOR]

By: _____
Signature

Name: _____
Print

Its: _____
Title

Pre-approved as to form:
CITY ATTORNEY
8/2016

END OF DOCUMENT

DOCUMENT 00 6536**GUARANTY**

TO: The City of Berkeley ("City"), for construction of Public Safety Building Jail Automation Upgrades located at 2100 Martin Luther King Jr Way, California.

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

Contractor hereby grants to City for a period of one year following the date of Final Acceptance of the Work completed, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one year, or longer if specified, from the date of Final Acceptance of the Work completed.

If within one year after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to City and in accordance with City's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by City and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.

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

All abbreviations and definitions of terms used in this Agreement shall have the meanings set forth in the Contract Documents.

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

Date: _____, 20____

Contractor's name

By: _____

Signature

Print Name

Title

Street Address

City, State, Zip code

END OF DOCUMENT

DOCUMENT 00 6580**CITY OF BERKELEY CONTRACTING POLICIES**

Contractor shall comply with the City of Berkeley's adopted employment policies applying to City construction projects as described in Document 00 7317. The following certifications/forms shall be submitted in accordance with Document 00 2113 Instructions to Bidders:

- Memorandum of Understanding
- Workforce Composition Form
- Agreement for Change in Subcontractors
- Nuclear Free Zone Disclosure Form
- Oppressive States Compliance Statement
- Sanctuary City Compliance Certification
- Hardwood Disclosure Form
- ~~First Source Construction Agreement (for projects between \$100,000 and \$500,000)~~
Not applicable to this project
- Community Workforce Agreement, Agreement to be Bound (for projects over \$500,000)
- Right to Audit Form
- Certification Of Compliance With Equal Benefits Ordinance
- Taxpayer Identification Report
- Contractor's License
- City of Berkeley Business License

**CITY OF BERKELEY
MEMORANDUM OF UNDERSTANDING
(MOU)**

1. The Contractor (and all Subcontractors) agree not to discriminate pursuant to City Ordinance No. 5876.
2. The Contractor agrees that he/she is also responsible for his/her Subcontractors' compliance with City of Berkeley Ordinance No. 5876.
3. For contracts over \$100,000, the Contractor agrees to comply with Ordinance No. 5876 as applied to the First Source Program (see Section 8 of Ordinance 5876).

The Contractor agrees to submit periodic employment and wage reports to the City's Contract Compliance Officer upon reasonable request.

Contractor

City of Berkeley Contracts Compliance Officer
Or his/her designee

Date

Date

**CITY OF BERKELEY
WORKFORCE COMPOSITION FORM FOR ALL CONSTRUCTION CONTRACTS**

This form is to be completed and submitted prior to the Contract Compliance Conference. The Contractor and all Subcontractors who will do work valued at \$3,000 or more are required to submit this form. Weekly payroll reports will be compared to this listing to monitor for compliance. A payroll printout or other listing of employees providing the same information will be accepted.

Name of Contractor/Subcontractor: _____

Project: _____

Name		Race*	Sex**	Trade/Craft	Basic Hourly Rate	Hire Date	Employees to be used on this job

* A=Asian or Pacific Islander **M = Male
 AI=American Indian **F = Female
 B=Afro American
 C=Caucasian
 H=Hispanic (Mexican, Puerto Rican,
 Spanish, Cuban, Chicano, Central
 or South American)
 8/91

Signature: _____ Date: _____
 Contractor/Subcontractor

Verified By: _____ Date: _____
 City of Berkeley Contracts Compliance Officer
 or his/her designee

**CITY OF BERKELEY
AGREEMENT FOR CHANGE IN SUB-CONTRACTORS**

I agree to use the Subcontractor(s) listed in the signed contract with the City of Berkeley. If it should become necessary to change Subcontractors, I will notify the Capital Projects Manager by completing the following information:

Current Subcontractor(s)	Alternate Subcontractors	Reason for Change	Date

Signed by:

Verified by:

Prime Contractor_____
Subcontractor_____
City of Berkeley Contracts Compliance Officer
Or his/her designee

Date: _____

Date: _____

Date: _____

CITY OF BERKELEY
NUCLEAR FREE ZONE DISCLOSURE FORM

I (we) certify that:

1. I am (we are) fully cognizant of any and all contracts held, products made or otherwise handled by this business entity, and of any such that are anticipated to be entered into, produced or handled for the duration of its contract(s) with the City of Berkeley. (To this end, this disclosure form may be signed by more than one individual, if a description of which type of contracts each individual is cognizant is attached.)

2. I (we) understand that Section 12.90.070 of the Nuclear Free Berkeley Act (Berkeley Municipal Code Ch. 12.90; Ordinance No. 5784-N.S.) prohibits the City of Berkeley from contracting with any person or business that knowingly engages in work for nuclear weapons.

3. I (we) understand the meaning of the following terms as set forth in Berkeley Municipal Code section 12.90.130:

"Work for nuclear weapons" is any work the purpose of which is the development, testing, production, maintenance or storage of nuclear weapons or the components of nuclear weapons; or any secret or classified research or evaluation of nuclear weapons; or any operation, management or administration of such work.

"Nuclear weapon" is any device, the intended explosion of which results from the energy released by reactions involving atomic nuclei, either fission or fusion or both. This definition of nuclear weapons includes the means of transporting, guiding, propelling or triggering the weapon if and only if such means is destroyed or rendered useless in the normal propelling, triggering, or detonation of the weapon.

"Component of a nuclear weapon" is any device, radioactive or non-radioactive, the primary intended function of which is to contribute to the operation of a nuclear weapon (or be a part of a nuclear weapon).

4. Neither this business entity nor its parent nor any of its subsidiaries engages in work for nuclear weapons or anticipates entering into such work for the duration of its contract(s) with the City of Berkeley.

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

Signed: _____

Date: _____

Printed Name and Title(s): _____

Company: _____

CITY OF BERKELEY**Oppressive States Compliance Statement for Personal Services**

The undersigned, an authorized agent of _____ (hereafter "Vendor"), has had an opportunity to review the requirements of Berkeley City Council Resolution Nos. 59,853-N.S., 60,382-N.S., and 70,606-N.S., (hereafter "Resolutions"). Vendor understands and agrees that the City may choose with whom it will maintain business relations and may refrain from contracting with those Business Entities which maintain business relationships with morally repugnant regimes. Vendor understands the meaning of the following terms used in the Resolutions:

"Business Entity" means "any individual, firm, partnership, corporation, association or any other commercial organization, including parent-entities and wholly-owned subsidiaries" (to the extent that their operations are related to the purpose of the contract with the City).

"Oppressive State" means: **Tibet Autonomous Region, the provinces of Abo, Kham, and U-Tsang; and Burma (Myanmar)**

"Personal Services" means "the performance of any work or labor and shall also include acting as an independent contractor or providing any consulting advice or assistance, or otherwise acting as an agent pursuant to a contractual relationship."

Contractor understands that it is not eligible to receive or retain a City contract if at the time the contract is executed, or at any time during the term of the contract it provides Personal Services to:

- a. The governing regime in any Oppressive State.
- b. Any business or corporation organized under the authority of the governing regime of any Oppressive State.
- c. Any person for the express purpose of assisting in business operations or trading with any public or private entity located in any Oppressive State.

Vendor further understands and agrees that Vendor's failure to comply with the Resolution shall constitute a default of the contract and the City Manager may terminate the contract and bar Vendor from bidding on future contracts with the City for five (5) years from the effective date of the contract termination.

The undersigned is familiar with, or has made a reasonable effort to become familiar with, Vendor's business structure and the geographic extent of its operations. By executing the Statement, Vendor certifies that it complies with the requirements of the Resolution and that if any time during the term of the contract it ceases to comply, Vendor will promptly notify the City Manager in writing.

Based on the foregoing, the undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

Business Entity: _____

I am unable to execute this Statement; however, Vendor is exempt under Section VII of the Resolution. I have attached a separate statement explaining the reason(s) Vendor cannot comply and the basis for any requested exemption.

Signature: _____ Date: _____

Contract Description/Specification No.: _____

ATTACHMENT D

Rev. 1/1/2023

CITY OF BERKELEY
Sanctuary City Compliance Statement

The undersigned, an authorized agent of _____ (hereafter "Contractor"), has had an opportunity to review the requirements of Berkeley Code Chapter 13.105 (hereafter "Sanctuary City Contracting Ordinance" or "SCCO"). Contractor understands and agrees that the City may choose with whom it will maintain business relations and may refrain from contracting with any person or entity that provides Data Broker or Extreme Vetting services to the U.S. Immigration and Customs Enforcement Division of the United States Department of Homeland Security ("ICE"). Contractor understands the meaning of the following terms used in the SCCO:

- a. "Data Broker" means either of the following:
 - i. The collection of information, including personal information about consumers, from a wide variety of sources for the purposes of reselling such information to their customers, which include both private-sector business and government agencies;
 - ii. The aggregation of data that was collected for another purpose from that for which it is ultimately used.
- b. "Extreme Vetting" means data mining, threat modeling, predictive risk analysis, or other similar services." Extreme Vetting does not include:
 - i. The City's computer-network health and performance tools;
 - ii. Cybersecurity capabilities, technologies and systems used by the City of Berkeley Department of Information Technology to predict, monitor for, prevent, and protect technology infrastructure and systems owned and operated by the City of Berkeley from potential cybersecurity events and cyber-forensic based investigations and prosecutions of illegal computer based activity.

Contractor understands that it is not eligible to receive or retain a City contract if at the time the Contract is executed, or at any time during the term of the Contract, it provides Data Broker or Extreme Vetting services to ICE.

Contractor further understands and agrees that Contractor's failure to comply with the SCCO shall constitute a material default of the Contract and the City Manager may terminate the Contract and bar Contractor from bidding on future contracts with the City for five (5) years from the effective date of the contract termination.

By executing this Statement, Contractor certifies that it complies with the requirements of the SCCO and that if any time during the term of the Contract it ceases to comply, Contractor will promptly notify the City Manager in writing. Any person or entity who knowingly or willingly supplies false information in violation of the SCCO shall be guilty of a misdemeanor and up to a \$1,000 fine.

Based on the foregoing, the undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this _____ day of _____, 20__, at _____, California.

Printed Name: _____ Title: _____

Signed: _____ Date: _____

Business Entity: _____

SCCO CompStmnt (Oct2019)

CITY OF BERKELEY
HARDWOOD DISCLOSURE FORM
For use by vendors on contracts utilizing lumber

1. I understand that on December 12, 1995, the City Council directed staff not to purchase lumber from companies that purchase or sell wood or paper products that come from tropical rainforests. I understand that wood species with tropical origins include, but are not limited to: Apitong, Banak, Bocote, Bubinga, Cocobolo, Cordia, Ebony, Goncalo alves, Greenheart, Iroko, Jelutang, Koa, Luauan, Mahogany, Meranti, Padauk, Purpleheart, Ramin, Rosewood, Satinwood, Teak, Virola, Wenge, and Zebrawood.

2. I am knowledgeable about the wood and paper products purchased and sold by this company.

3. This company does not currently purchase or sell wood or paper products having their origins in tropical rainforests. In addition, this company will not, for the duration of its contract with the City of Berkeley, purchase or sell wood or paper products having their origins in tropical rainforests.

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

Signed: _____ Date: _____

Printed Name & Title: _____

Company: _____

I am unable to sign this disclosure form for the following reason(s):

FIRST SOURCE CONSTRUCTION AGREEMENT**EXHIBIT "A"**

First Source Construction Agreement

I certify that:

- I. I am authorized to enter into this agreement on behalf of the company whose name appears below ("Contractor").
- II. Contractor understands and agrees to comply with the City of Berkeley First Source Construction Agreement.
- III. **I choose Method One: check here _____**
 - A. Contractor understands that selecting Method One agreement with the City of Berkeley means that Contractor agrees as follows:
 1. To utilize the First Source Program Construction Employment Program as the first place for recruitment and referral of applicants for new and replacement workers.
 2. To allow the First Source Program a minimum of seventy-two (72) hours to refer applicants to Contractors. (Contractor may apply to the City of Berkeley for a waiver of the seventy-two hour requirement for an emergency situation.)
 3. To employ qualified applicants referred by the First Source Program.
 4. To fully document the reason(s) for not hiring persons referred by the First Source Program.
 5. To provide to the First Source Program, upon request, information on the employment status of First Source Program placements, and reason for separation if employee is terminated.
 - B. Should the First Source Program be unable to provide the employees needed, Contractor or subcontractor is relieved of its obligation to achieve the goals of the First Source Program.
 1. No documentation of "good Faith Effort Steps" would be required of Contractor and subcontractors
 2. No penalty would be assessed.
 - C. Contractor must go back to the First Source Program whenever its employment needs increase, to comply with the First Source Program.
 - D. Should Contractor or a listed subcontractor fail to comply with the First Source Program, Contractor shall be liable for liquidated damages in the amount of \$1,000 or 1% of the contract amount for each day of non-compliance. In addition, Contractor or listed subcontractor may be deemed a non-responsible bidder in connection with future City of Berkeley contracts.

IV. I choose Method Two: check here _____

- A. Should the contractor choose Method Two, Contractor can use any means of hiring Berkeley residents to achieve the goal. This also can include using union hiring halls requesting in writing for Berkeley residents. A copy must be sent to the First Source Program.
- B. Should Contractor or subcontractor fail to achieve the goals at any time during the course of this project, Contractor or listed subcontractor will be required to document compliance with each of the "good Faith Effort Steps" listed in the First Source Program description document.
- C. Should Contractor or a listed subcontractor fail to comply with the First Source Program, Contractor shall be liable for liquidated damages in the amount of \$1,000 or 1% of the contract amount for each day of non-compliance. In addition, Contractor or listed subcontractor may be deemed a non-responsible bidder in connection with future City of Berkeley contracts.

Company Name

Owner/Authorized Representative Signature

Address

Printed Name of Owner / Authorized Representative

Telephone Number

AGREEMENT TO BE BOUND

The undersigned, as a Contractor or Subcontractor ("Contractor") on a City Project ("Project"), for and in consideration of the award to it of a contract to perform work on said Project, and in further consideration of the mutual promises made in the Project's Community Workforce Agreement ("Agreement"), a copy which was received and is acknowledged, hereby:

1. Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all amendments and supplements now existing or which are later made to said Agreement.
2. Certifies that it has no commitments or agreements which would preclude its full and complete compliance with the terms and conditions of said Agreement;
3. Agrees to secure from any Contractor (as defined in said Agreement) which is or becomes a subcontractor (or any tier) to it, and from any successors, a duly executed Agreement to be Bound in form identical to this document.
4. Contractor agrees that it shall be bound by all applicable trust agreements and plans for the provision of such fringe benefits as accrue to the direct benefit of the construction persons, including Health and Welfare, Pension, Training, Vacation, and/or other direct benefits provided pursuant to the appropriate craft agreement contained in Schedule "A" of Agreement.

Date: _____

Company Name: _____

Name of Prime Contractor or Higher Level Subcontractor:

Name of Project: _____

Signature: _____

Print Name: _____

Title: _____

Mailing Address: _____

Email Address: _____

Contractor's License #: _____

Motor Carrier Permit (CA) #: _____

CITY OF BERKELEY RIGHT TO AUDIT FORM

The Contractor agrees that pursuant to Section 61 of the Berkeley City Charter, the City Auditor's office may conduct an audit of Contractor's financial, performance and compliance records maintained in connection with the operations and services performed under this contract.

In the event of such audit, Contractor agrees to provide the Auditor with reasonable access to Contractor's employees and make all such financial, performance and compliance records available to the Auditor's office. City agrees to provide Contractor an opportunity to discuss and respond to any findings before a final audit report is filed.

Contractor's signature _____ Date: _____

Print Name and Title: _____

Company: _____

To be completed by
Contractor/Vendor

**Form EBO-1
CITY OF BERKELEY**



CERTIFICATION OF COMPLIANCE WITH EQUAL BENEFITS ORDINANCE

If you are a **contractor**, return this form to the originating department/project manager. If you are a **vendor** (supplier of goods), return this form to the Purchasing Division of the Finance Dept.

SECTION 1. CONTRACTOR/VENDOR INFORMATION

Name:		Vendor No.:	
Address:	City:	State:	ZIP:
Contact Person:	Telephone:		
E-mail Address:	Fax No.:		

SECTION 2. COMPLIANCE QUESTIONS

- A. The EBO is inapplicable to this contract because the contractor/vendor has no employees.
☐ Yes ☐ No (If "Yes," proceed to Section 5; if "No," continue to the next question.)
- B. Does your company provide (or make available at the employees' expense) any employee benefits?
☐ Yes ☐ No
 If "Yes," continue to Question C.
 If "No," proceed to Section 5. (The EBO is not applicable to you.)
- C. Does your company provide (or make available at the employees' expense) any benefits to the spouse of an employee? ☐ Yes ☐ No
- D. Does your company provide (or make available at the employees' expense) any benefits to the domestic partner of an employee? ☐ Yes ☐ No
If you answered "No" to both Questions C and D, proceed to Section 5. (The EBO is not applicable to this contract.)
If you answered "Yes" to both Questions C and D, please continue to Question E.
If you answered "Yes" to Question C and "No" to Question D, please continue to Section 3.
- E. Are the benefits that are available to the spouse of an employee identical to the benefits that are available to the domestic partner of the employee? ☐ Yes ☐ No
If you answered "Yes," proceed to Section 4. (You are in compliance with the EBO.)
If you answered "No," continue to Section 3.

SECTION 3. PROVISIONAL COMPLIANCE

- A. Contractor/vendor is not in compliance with the EBO now but will comply by the following date:
- ☐ By the first effective date after the first open enrollment process following the contract start date, not to exceed two years, if the Contractor submits evidence of taking reasonable measures to comply with the EBO; or
- ☐ At such time that administrative steps can be taken to incorporate nondiscrimination in benefits in the Contractor's infrastructure, not to exceed three months; or
- ☐ Upon expiration of the contractor's current collective bargaining agreement(s).
- B. If you have taken all reasonable measures to comply with the EBO but are unable to do so, do you agree to provide employees with a cash equivalent?* ☐ Yes ☐ No

* The cash equivalent is the amount of money your company pays for spousal benefits that are unavailable for domestic partners.

SECTION 4. REQUIRED DOCUMENTATION

At time of issuance of purchase order or contract award, you may be required by the City to provide documentation (copy of employee handbook, eligibility statement from your plans, insurance provider statements, etc.) to verify that you do not discriminate in the provision of benefits.

SECTION 5. CERTIFICATION

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I am authorized to bind this entity contractually. By signing this certification, I further agree to comply with all additional obligations of the Equal Benefits Ordinance that are set forth in the Berkeley Municipal Code and in the terms of the contract or purchase order with the City.

Executed this _____ day of _____, in the year _____, at _____, _____
(City) (State)

Name (please print)

Signature

Title

Federal ID or Social Security Number

FOR CITY OF BERKELEY USE ONLY

- ☐ Non-Compliant (The City may not do business with this contractor/vendor)
- ☐ One-Person Contractor/Vendor ☐ Full Compliance ☐ Reasonable Measures
- ☐ Provisional Compliance Category, Full Compliance by Date: _____
- Staff Name(*Sign and Print*): _____ Date: _____

TAXPAYER IDENTIFICATION REPORT

NAME/COMPANY'S NAME: _____

MAILING ADDRESS: _____

SOCIAL SECURITY NO.: _____

OR

EMPLOYER IDENTIFICATION NO.: _____

My Company is a Corporation []

My Company is not a Corporation []

I certify that the above information is true and correct:

(Signature)

(Title)

The Tax Equity and Fiscal Responsibility Act of 1982 (Public Law 97-248) requires the above reporting information be furnished to the City.

Persons who do not furnish their tax information numbers become subject to backup withholding by the City at a rate of 20% from each disbursement made to the recipient.

END OF DOCUMENT

DOCUMENT 007200**GENERAL CONDITIONS**

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GENERAL CONDITIONS

ARTICLE 1 – INTERPRETATION OF CONTRACT DOCUMENTS

1.01 Interpretation Of Documents

- A. Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. Individual Contract Documents subdivide at first level into Articles, and then into paragraphs.

1.02 Order Of Precedence Of Documents

- A. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:
 - 1. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
 - 2. Agreement Forms (Document 00 5200), and terms and conditions referenced therein;
 - 3. Supplementary General Conditions (Document 00 7201 et seq), if included;
 - 4. General Conditions (Document 00 7200);
 - 5. Division 1 Specifications, if included;
 - 6. Drawings and Technical Specifications (Division 2 and above);
 - 7. Written numbers over figures, unless obviously incorrect;
 - 8. Figured dimensions over scaled dimensions;
 - 9. Large-scale Drawings over small-scale Drawings.
- B. Any conflict between Drawings and Technical Specifications (Division 2 and above) will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.
- C. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.
- D. All Technical Specifications included in the Project manual shall be included within the Contract Documents unless identified otherwise.

ARTICLE 2 – PRE-BID INVESTIGATIONS

2.01 Pre-Bid Investigations Required

- A. Prior to and as a condition of submitting a Bid and executing Document 00 5200 (Agreement), Contractor shall make reasonable efforts to investigate fully the Work of the Contract. Contractor shall visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions.
- B. Contractor's investigation shall include, without limitation, requesting and thoroughly examining of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, made available by City for contracting purposes or during Contractor's pre-bid investigations, of existing above ground and (to the extent applicable) below ground conditions (together, "Existing Conditions Data"), including, as applicable, Underground Facilities, geotechnical data, as-built data, utility surveys, record documents of all types, hazardous materials surveys, or similar materials which may appear or be referenced in the Project Manual or the in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.
- C. Contractor's investigations shall consider fully the fact that Existing Conditions Data is in many cases based on information furnished to City by others (e.g., the prior owner or builders), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor shall also: (i.) provide City with prompt written notice of all

conflicts, errors, ambiguities, or discrepancies of any type, that it discovered in or among the Contract Documents and the Existing Conditions Data, and (ii.) subject to City's approval, conduct any such additional or supplementary examinations, investigations, explorations, tests, studies and data compilations, concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which Contractor may deem necessary in order to perform and furnish the Work in accordance with the terms and conditions of Contract Documents.

- D. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing these pre-bid investigations and other obligations, and shall not be entitled to Change Orders (time or compensation) due to any information, error, inconsistency, omission, or conditions that Contractor should have known as a part of this Work. Contractor shall be responsible for the resultant losses, including, without limitation, the cost of correcting Defective Work.

2.02 Limited Reliance Permitted On City's Existing Conditions Data

- A. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied by City, such information has been compiled in good faith, however, City does not expressly or impliedly warrant or represent that such information is correctly shown or indicated, or otherwise complete for construction purposes. Contractor must independently verify such information as part of its pre-bid investigations, and where conditions are not reasonably verifiable or discrepancies are identified, bring such matters to City's attention through written question issued during the bid period. In executing Document 00 5200 (Agreement), Contractor shall rely on the results of its own independent investigation and shall not rely on City-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.
- B. Regarding subsurface conditions other than Underground Facilities shown on the Contract Documents or otherwise supplied by City, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. City is not responsible for the completeness of any subsurface condition information, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, City is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

2.03 Pre-Bid Investigation Requirements For Excavation And Utilities Relocation Projects

- A. As part of its pre-bid investigations for Projects involving excavation and/or relocation of existing utilities, Contractor shall make reasonable efforts to verify information regarding Underground Facilities, including but not limited to, requesting additional information or verification of information as necessary.
- B. Because of the nature and location of City and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. Contractor shall, therefore, take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site). Contractor shall also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

ARTICLE 3 – SUBCONTRACTORS**3.01 Subcontractor Listing Law**

- A. Contractor shall comply with the Subcontractor Listing law, California Public Contract Code §§4101 et seq. Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid except as may be allowed by law.
- B. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without City's written approval. At City's request, Contractor shall provide City with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

3.02 Subcontracts

- A. Subcontract agreements shall preserve and protect the rights of City under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written agreement (1) to be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward City under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)
- B. Contractor shall provide for the assignment to City of all rights any Subcontractor (of any tier) may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents. Subcontracts shall provide and acknowledge City as an intended third-party beneficiary of each subcontract and supply contract (of any tier).

ARTICLE 4 – DRAWINGS AND SPECIFICATIONS**4.01 Intent Of Drawings And Specifications**

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

4.02 Checking Of Drawings And Specifications

- A. Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent figures shown in the Contract Documents and all

applicable field measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not scale measurements. Contractor shall promptly report to City, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from City before proceeding with any Work affected thereby. Contractor shall provide City with a follow-up correspondence every ten calendar days until it receives a satisfactory interpretation or clarification.

4.03 Interpretation Of Drawings And Specifications

- A. A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by City. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.
- B. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in Drawings and Specifications, or should Contractor have any questions or requests relating to Drawings or Specifications, Contractor shall refer the matter to City, in writing, with a copy to the Architect/Engineer. City will issue with reasonable promptness written responses, clarifications or interpretations as City may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give City prompt written notice. If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with City's response, clarification, or interpretation and may make a written claim for the adjustment as provided in Article 12.
- C. The following general specifications shall apply wherever in the Specifications, or in any directions given by City in accordance with or supplementing Specifications, it is provided that Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed specifications are shown. Materials or manufactured articles shall be of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried in stock, the materials or manufactured articles shall conform to industry standards for first class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited herein, for first class work of the kind required. Contractor shall specify in writing to City the materials to be used or Work to be performed under this Paragraph ten Business Days prior to furnishing such materials or performing such Work.

4.04 Use Of Drawings And Specifications.

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

ARTICLE 5 – COMMENCEMENT OF THE WORK

5.01 Submission Of Required Schedules

- A. Contractor shall submit to City in draft for review and discussion at the Preconstruction Conference, and in final prior to the first payment application, the following schedules:
 - 1. Schedule of Values
 - 2. Progress Schedule, and
 - 3. Schedule of Submittals.
- B. No progress payment shall be due or owing to Contractor until such schedules are submitted to and acceptable to City and/or Architect/Engineer as meeting the requirements of the Contract

Documents. In City's sole discretion, City may elect to instead withhold a portion of any progress payment for unacceptable compliance with contract requirements for such schedules.

- C. City's acceptance of Contractor's schedules will not create any duty of care or impose on City any responsibility for the sequencing, scheduling or progress of Work nor will it interfere with or relieve Contractor from Contractor's full responsibility therefore.

5.02 Commencement Date Of Contract Time

- A. The Contract Time will commence to run on the 60th Day after the issuance of the Notice of Award or, if a Notice to Proceed is given, on the date indicated in the Notice to Proceed.
- B. City may give a Notice to Proceed at any time within 60 calendar days after the Notice of Award. Contractor shall not do any Work at the Site prior to the date on which the Contract Time commences to run.

ARTICLE 6 – CONTRACTOR'S ORGANIZATION AND EQUIPMENT

6.01 Contractor's Legal Address

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

6.02 Contractor's Superintendents Or Forepersons

- A. Contractor shall at all times be represented on Site by one or more superintendents or forepersons authorized and competent to receive and carry out any instructions that City may give, and shall be liable for faithful observance of instructions delivered to Contractor or to authorized representative or representatives on Site.

6.03 Proficiency In English

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

6.04 Contractor's And Subcontractors' Employees

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

6.05 Contractor's Use Of The Site

- A. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between City and any owner, former owner

or tenant of such land, structure or buildings. Contractor may not occupy City-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior approval from City.

6.06 Contractor's Site Office

- A. Unless expressly provided otherwise in the Contract Documents, Contractor shall provide a site office staffed by a resident project manager or job superintendent.

ARTICLE 7 – CITY'S ADMINISTRATION OF WORK

7.01 City's Representative(s)

- A. City's Representative(s) will have limited authority to act on behalf of City as set forth in the Contract Documents.
- B. Except as otherwise provided in these Contract Documents or subsequently identified in writing by City, City will issue all communications to Contractor through City's Representative, and Contractor shall issue all communications to City through City's Representative in a written document delivered to City.
- C. Should any direct communications between Contractor and City's consultants, architects or engineers not identified in Article 2 of Document 00 5200 (Agreement) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to City.

7.02 City's Observation Of The Work

- A. Work shall be performed under City's general observation and administration. Contractor shall comply with City's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. City's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.
- B. Subject to those rights specifically reserved in the Contract Documents, City will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing or performance of Work. City will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

7.03 Architect/Engineer's Observation Of Work

- A. City may engage an Architect/Engineer, an independent consultant or Project Manager (collectively for purposes of this Paragraph, "Project Manager/Architect") to assist in administering the Work. If so engaged, Project Manager/Architect will advise and consult with City, but will have authority to act on behalf of City only to extent provided in the Contract Documents or as set forth in writing by City. Project Manager/Architect will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Project Manager/Architect will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.
- B. Project Manager/Architect may review Contractor's Submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents.
- C. Project Manager/Architect may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Project Manager/Architect may recommend to City that it disapproves or rejects Work that Project Manager/Architect believes to be Defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. City will also have authority

to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.

- D. Project Manager/Architect may conduct inspections to recommend to City the dates that Contractor has achieved Substantial Completion and Final Acceptance, and will receive and forward to City for review written warranties and related documents required by Contract Documents.

7.04 Owner's And Architect/Engineer's Exercise Of Contract Responsibilities

- A. City, Project Manager, Architect/Engineer and all City's representatives, in performing their duties and responsibilities under the Contract Documents, accept no duties, responsibilities or duty of care, nor may the same be implied or inferred, towards Contractor, any Subcontractor, sub-Subcontractor or supplier, except those set forth expressly in the Contract Documents.

7.05 City's Right Of Access To The Work

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

7.06 City's Right Of Separate Construction

- A. City may perform with its own forces, construction or operations related to the Project, or the Site during Contractor's operations. City may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility owners perform other work.
- B. Contractor shall adjust its schedule and fully coordinate with and shall afford all other contractors, utility districts and City (if City is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' work, do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work, and shall cooperate with them to facilitate the progress of the Work.
- C. To the extent that any part of Contractor's Work is to interface with work performed or installed by other contractors or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to City in writing any defect in in-place work that will impede or increase the cost of Contractor's interface unless corrected.

ARTICLE 8 – CONTRACTOR'S PROSECUTION AND PROGRESS OF THE WORK

8.01 Contractor To Supervise The Work

- A. Subject to those rights specifically reserved in the Contract Documents, Contractor shall supervise, direct, have control over, and be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, safety precautions and programs incident thereto, and compliance with laws and regulations applicable to the furnishing or performance of Work.
- B. Contractor shall keep on the Site at all times during Work progress a competent resident Superintendent, who shall not be replaced without City's express written consent. The Superintendent shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent shall be as binding as if given to or by Contractor.
- C. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the

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

- D. Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor.
- E. Contractor shall conduct monthly Contractor Safety Committee meetings, and weekly toolbox safety talks.

8.02 Contractor To Maintain Cost Data

- A. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide City with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide City with a copy of such report upon City's request.
- B. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide City with copies for each Day Contractor works on the Project, to be delivered to City either the same Day or the following morning before starting work at the Site. Contractor shall take pre-construction and monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.
- C. City shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. By way of example, City shall have the right to inspect and obtain copies of all Contract Documents, planning and design documents, Bid proposal and negotiation documents, cost records and job cost variance reports, design modification proposals, value engineering or other cost reduction proposals, revisions made to the original design, job progress reports, photographs, and as-built drawings maintained by Contractor. City and any other applicable governmental entity shall have the right to inspect all information and documents maintained hereunder at any time during the Project and for a period of five years following Final Completion, in accordance with the provisions of Section 8546.7 of the California Government Code. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

8.03 Contractor To Supply Sufficient Workers And Materials

- A. Unless otherwise required by City under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.
- B. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then City may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as City may consider necessary, at no cost to City. If Contractor does not comply with the notice within three Business Days of date of service thereof, City shall have the right (but not a duty) to provide materials and qualified

workers to finish the Work or any affected portion of Work, as City may elect. City may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate work elements during the time period that City exercises this right. City will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. City will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of City from claims of others.

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

8.04 Contractor To Maintain Project Record Documents

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all as-built changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to City for reference. Upon completion of the Work, Contractor shall deliver to City, the Project Record Documents, Samples and Shop Drawings and as-built drawings.
- B. Throughout Contractor's performance of the Work of the Project, Contractor shall maintain construction records to include: shop drawings; product data/material data sheets; samples; submittal; purchases; materials; equipment; inspections; applicable handbooks; applicable codes and standards; maintenance and operating manuals and instructions; RFI Log; Submittal Log; other related documents and revisions which arise out of the Construction Contracts. Contractor shall maintain records of principal building layout lines, elevations for the bottom of footings, floor levels, and key site elevations (certified by a qualified surveyor or professional engineer). Contractor shall make all records available to City. At the completion of the Project, Contractor shall deliver all such records to the City to have a complete set of record as-built drawings.

8.05 Contractor To Not Disrupt City Operation

- A. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt City operations, including but not limited to, parking, utilities (electricity, gas, water), noise, access by employees and administration, access by vendors, physicians, patients and any other person or entity using City facilities or doing business with City. Contractor shall produce and supply coordination plans and requests to City, following City procedures, for all necessary interference of construction with City, which City will reasonably cooperate with.

8.06 Contractor To Provide Temporary Facilities And Controls

- A. Unless expressly provided otherwise in the Contract Documents, Contractor shall provide all temporary utilities (including without limitation electricity, water, natural gas), lighting, heating, cooling and ventilating devices, telephone, sanitary facilities, barriers, fences and enclosures, tree and plant protection, fire protection, pollution, erosion, Storm Water Pollution Prevention controls, noise and traffic control, and any other necessary services required for construction, testing or completion of the Work.

ARTICLE 9 – WARRANTY, GUARANTY, AND INSPECTION OF WORK

9.01 Warranty And Guaranty

- A. General Representations and Warranties: Contractor represents and warrants that it is and will

be at all times fully qualified and capable of performing every Phase of the Work and to complete Work in accordance with the terms of Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, engineering, materials, construction and workmanship.

Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by Contract Documents.

- B. Extended Guarantees: Any guarantee exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply City with all warranty and guarantee documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.
- C. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this Paragraph are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to City that:
 - 1. To Contractor's knowledge after due inquiry, no lead or Asbestos-containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or Asbestos-containing materials were discovered, Contractor made immediate written disclosure to City.
 - 2. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor's construction thereof.
 - 3. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to City.
 - 4. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any Work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide City with copies thereof.

9.02 Inspection Of Work

- A. Work and materials, and manufacture and preparation of materials, from beginning of construction until Final Completion and acceptance of Work, shall be subject to inspection and rejection by City, its agents, representatives or independent contractors retained by City to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, City shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.
- B. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, Samples or test specimens of all materials to be used or offered for use in connection

with Work. Contractor shall prepare Samples or test specimens at its expense and furnish them to City. Contractor shall submit all Samples in ample time to enable City to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

- C. Contractor shall give City timely notice of readiness of Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- D. If applicable laws or regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish City with the required certificates of inspection, or approval. City will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.
- E. If Contractor covers any Work, or the work of others, prior to any required inspection, test or approval without written approval of City, Contractor shall uncover the Work at City's request. Contractor shall bear the expense of uncovering Work and replacing Work. In any case where Contractor covers Work contrary to City's request, Contractor shall uncover Work for City's observation or inspection at City's request. Contractor shall bear the cost of uncovering Work.
- F. Whenever required by City, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory, City, in manner herein prescribed for paying for alterations, Modifications, and extra Work, except as otherwise herein specified, will pay for examination.
- G. Inspection of the Work by or on behalf of City, or City's failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Contractor shall have an absolute duty, in the absence of a written Change Order signed by City, to perform Work in conformance with the Contract Documents and to immediately correct Defective Work immediately upon Contractor's knowledge.
- H. Any inspection, evaluation, or test performed by or on behalf of City relating to the Work is solely for the benefit of City, and shall not be relied upon by Contractor. Contractor shall not be relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by City, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

9.03 Correction Of Defective Work

- A. City may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not Defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from monies due Contractor, all such claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with City's calculations, it may make a claim as provided in Article 12 of this Document 00 7200. City's rights under this Paragraph shall be in addition to any other rights it may have under the Contract Documents or by law.

- B. If Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, City may order Contractor to replace any such Defective Work, or stop any portion of Work to permit City (at Contractor's expense) to replace such Defective Work. These City rights are entirely discretionary on the part of City, and shall not give rise to any duty on the part of City to exercise the rights for the benefit of Contractor or any other party.

9.04 Acceptance And Correction Of Defective Work By City

- A. City may in its sole discretion elect to accept Defective Work. Contractor shall pay all claims, costs, losses and damages attributable to City's evaluation of and determination to accept such Defective Work. If City accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may deduct from monies due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with City's calculations, Contractor may make a claim as provided in Article 12 of this Document 00 7200. If City accepts any Defective Work after final payment, Contractor shall pay to City, an appropriate amount as determined by City.
- B. City may correct and remedy deficiency if, after five calendar days' written notice to Contractor, Contractor fails to correct Defective Work or to remove and replace rejected Work; or provide a plan for correction of Defective Work acceptable to City; or perform Work in accordance with Contract Documents. In connection with such corrective and remedial action, City may exclude Contractor from all or part of the Site; take possession of all or part of Work and suspend Contractor's Work related thereto; take possession of all or part of Contractor's tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which City has paid Contractor but which are stored elsewhere. Contractor shall allow City, its representatives, agents, employees, and other contractors and Project Manager/Architect's consultants' access to the Site to enable City to exercise the rights and remedies under this Paragraph. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by City in exercising such rights and remedies. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, City may deduct from moneys due Contractor, all claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with City's calculations, Contractor may make a claim as provided in Article 12.

9.05 Rights Upon Inspection, Correction Or Acceptance

- A. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by City of its rights and remedies under this Article. Where City exercises its rights under this Article, it retains and may still exercise all other rights it has by law or under the Contract Documents including, but not limited to, the right to terminate Contractor's right to proceed with the Work under the Contract Documents for cause and/or make a claim or back charge where a Change Order cannot be agreed upon.
- B. Inspection by City or its authorized agents or representatives shall not relieve Contractor of its obligation to have furnished material and workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments, final payment or otherwise shall not operate to waive City's right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of any defective Work paid therefor. Contractor's obligation to complete the Work in accordance with Contract Documents shall be absolute, unless City agrees otherwise in writing.

9.06 Proof Of Compliance Of Contract Provisions

- A. In order that City may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of

Work and materials, Contractor shall at any time, when requested, submit to City properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

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

9.07 Correction Period And Project Warranty Period:

- A. If within one year after the date of Final Acceptance, or such longer period of time as may be prescribed by laws, regulations or by the terms of Contract Documents or any extended warranty or guaranty, any Work (completed or incomplete) is found to be Defective, Contractor shall promptly without cost to City and in accordance with City's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by City and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.
- B. In special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Final Acceptance of all the Work, the correction period for that part of Work or that item may start to run from an earlier date if so provided by Change Order.
- C. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been corrected, removed, or replaced under this provision after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

9.08 No Waiver

- A. Neither recordation of Final Acceptance nor final certificate for payment nor provision of the Contract nor partial or entire use or occupancy of premises by City shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.
- B. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to City, City shall have right to operate and use materials or equipment until said materials and equipment can, without damage to City, be taken out of service for correction or replacement. Period of use of Defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.
- C. Nothing in the Contract Documents shall be construed to limit, relieve, or release Contractor's, Subcontractors', and equipment suppliers' liability to City for damages sustained as result of latent defects in materials or equipment caused by negligence of Contractor, its agents, suppliers, employees, or Subcontractors.

ARTICLE 10 – MODIFICATIONS OF CONTRACT DOCUMENTS

10.01 City's Right To Direct Changed Work.

- A. City may, without notice to the sureties and without invalidating the Contract, make changes in the Work ("Changed Work"), including without limitation: alterations, deviations, additions to, or

deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, reduce or otherwise change the Contract Time; delete any item or portion of the Work; and require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless specifically provided otherwise at the time the change is ordered. In the case of any ordered extra Work, City reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such City-furnished labor, materials, and equipment.

- B. If Changed Work is of such a nature as to increase or decrease the time or cost of any part of Work, price fixed in Contract shall be increased or decreased by amount as the Contractor and City may agree upon as reasonable and proper allowance for increase or decrease in cost of Work using the cost guidelines set forth in this Article, and absent such agreement, then as City may direct (with Contractor retaining its rights under Article 12 herein).

10.02 Required Documentation For Changed Work

- A. Changes affecting the Contract Time or Contract Sum of the Work shall be set forth in a written Change Order or Change Directive that shall specify:
 - 1. The Work performed in connection with the change to be made;
 - 2. The amount of the adjustment of the Contract Sum, if any, and the basis for compensation for the Work ordered; and
 - 3. The extent of the adjustment in the Contract Time, if any.
- B. A Change Order or Change Directive will become effective when signed by City, notwithstanding that Contractor has not signed it. A Change Order will become effective without Contractor's signature, provided City indicates same thereon (by indicating it as a "unilateral change order").
- C. All changes in any plans and specifications approved by any authority with jurisdiction may also require addenda or change orders approved by that authority.
- D. Where City requests, a performance bond rider covering the changed Work must be executed and delivered to City before proceeding with the changed Work or shortly in time thereafter.

10.03 Procedures And Pricing Of Changed Work

- A. Procedures for changed work and pricing of changed work, claims and all forms of extra compensation, are set forth in Section 01 2600 (Modification Procedures).

ARTICLE 11 – TIME ALLOWANCES

11.01 Time Allowances

- A. Time is of the essence. Contract Time may only be changed by Change Order, and all time limits stated in the Contract Documents are to mean that time is of the essence.

11.02 Excusable Delay And Inexcusable Delay Defined.

- A. Excusable Delay. Subject to the provisions on Notice of Delay below, Contract Time may be adjusted in an amount equal to the time lost due to:
 - 1. Changes in the Work ordered by City ("**Changes**");
 - 2. Acts or neglect by City, Architect, any City Representative, utility owners or other contractors performing other work, not permitted or provided for in the Contract Documents, provided that Contractor has performed its responsibilities under the Contract Documents (including but not limited to pre-bid investigations) ("**Acts or Neglect**"); or
 - 3. Fires, floods, epidemics, abnormal weather conditions beyond the parameters otherwise set forth in this Article, earthquakes, civil or labor disturbances, or acts of God (together, "force majeure events"), provided damages resulting therefrom are not the result of Contractor's failure to protect the Work as required by Contract Documents ("**Force Majeure**").
- B. Inexcusable Delay. Contract Time shall not be extended for any period of time where Contractor (and/or any Subcontractor) is delayed or prevented from completing any part of the Work due to a

cause that is within Contractor's risk or responsibility under the Contract Documents. Delays attributable to or within the control of a Subcontractor, or its subcontractors, or supplier, are deemed delays within the control of Contractor.

- C. Float. Float shall be treated as a Project resource. Contractor shall not be entitled to a time extension for impacts that consume float, but do not impact the critical path.

11.03 Notice Of Delay

- A. Within seven calendar days of the beginning of any delay (excepting adverse weather delays), Contractor shall notify City in writing, by submitting a notice of delay that shall describe the anticipated delays resulting from the delay event in question. If Contractor requests an extension of time, Contractor shall submit a Time Impact Evaluation (TIE) within ten calendar days of the notice of delay. City will determine all claims and adjustments in the Contract Time. No claim for an adjustment in the Contract Time will be valid and such claim will be waived if not submitted in accordance with the requirements of this subparagraph. In cases of substantial compliance with the seven-day notice requirement here (but not to exceed twenty-one calendar days from the beginning of the delay event), City may in its sole discretion recognize a claim for delay accompanied with the proper TIE, provided Contractor also shows good faith and a manifest lack of prejudice to City from the late notice.

11.04 Compensable Time Extensions

- A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Sum in addition to Contract Time for:
1. Excusable delay caused solely by Changes in the Work ordered by City, as provided above, and/or
 2. Excusable delay caused solely by Acts or Neglect by City or other person, as provided above.

11.05 Non-Compensable Time Extensions

- A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Time only, without adjustment in Contract Sum, for
1. Periods of excusable delay caused solely by weather or Force Majeure events as provided above in this Article, or
 2. Periods of concurrent delay, where delay results from two or more causes, one of which is compensable (resulting from Changes or Acts or Neglect as set forth above in this Article), and the other of which is non-compensable or unexcusable, such as: acts or neglect of Contractor, Subcontractors or others for whom Contractor is responsible; other acts, omissions and conditions which would not entitle Contractor to adjustment in Contract Time; adverse weather; and/or actions of Force Majeure as provided above in this Article.

11.06 Adverse Weather

- A. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds the parameters listed or referenced immediately below in this subparagraph and Contractor proves that adverse weather actually caused delays to work on the critical path. Contractor shall give written notice of intent to claim an adverse weather day within one Day of the adverse weather day occurring.
- B. Claims for extension of time for rain delay will not be granted unless the number of calendar days work is prevented by rain exceeds 110% of the average number of rain days expected for the period of the Contract Time, based on the records of the National Oceanic & Atmospheric Administration (NOAA) weather station closest to the Project Site, as measured and reported by NOAA. (For example, for California, Oregon and Washington, these figures are contained in the ">=0.10 inch" column at the applicable weather station's "General Climate Summary Table" for "Precipitation" at <http://www.wrcc.dri.edu/Climsum.html>), pro-rated in the individual month Contractor starts and finishes Work. Delays due to adverse weather conditions will not be allowed for weather conditions that fall within these parameters.

- C. In order to qualify as an adverse weather delay with respect to the foregoing parameters, (i.) daily rainfall must exceed .1 inch, and/or (ii.) daily snowfall must exceed 1.0 inch or more, at the NOAA station located closest to the Project site, as measured and reported by NOAA. Notwithstanding these allowances, Contractor shall at all times employ all available mitigation measures to enable Work to continue, Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, lime treatment, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for City to not grant a time extension due to adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.
- D. Contractor shall include the foregoing precipitation parameters as a monthly activity in its progress schedule. As Work on the critical path is affected by precipitation, Contractor shall notify City and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float available to either City or Contractor.
- E. Adverse weather delay for precipitation shall be recognized for the actual period of time Contractor proves it was delayed by precipitation exceeding the specified parameters. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor's progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to City's satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.
- F. During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall employ best practices to protect the Work, manage the construction site and rainwater during inclement weather. Persons performing the Work shall examine surfaces to receive their Work and shall report in writing to Contractor, with copy to City representative and the Architect conditions detrimental to the Work. Failure to examine and report discrepancies makes the Contractor responsible, at no increase in Contract Sum, for corrections City may require. Commencement of Work constitutes acceptance of surface.

11.07 Liquidated Damages

- A. Time is of the essence. Execution of Contract Documents by Contractor shall constitute its acknowledgement that City will actually sustain damages in the form of Contract administration expenses (such as Project management and consultant expenses) in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion plus extensions of time allowed pursuant to provisions hereof.
- B. Contractor and City agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of such actual damages incurred by City because of a delay in completion of all or any part of the Work. Contractor and City agree that specified measures of liquidated damages shall be presumed to be the amount of such damages actually sustained by City, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.
- C. Liquidated damages for delay shall cover administrative, overhead, interest on bonds, and general loss of public use damages suffered by City as a result of delay. Liquidated damages shall not cover the cost of completion of the Work, damages resulting from Defective Work, lost revenues or costs of substitute facilities, or damages suffered by others who then seek to recover their damages from City (for example, delay claims of other contractors, subcontractors, tenants, or other third-parties), and defense costs thereof. City may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages.

ARTICLE 12 – CLAIMS BY CONTRACTOR

12.01 Obligation to File Claims for Disputed Work

- A. Should it appear to Contractor that the Work to be performed or any of the matters relative to the

Contract Documents are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of the Contract Documents, or should any dispute arise regarding the true value of any work performed, work omitted, extra work that the Contractor may be required to perform, time extensions, payment to the Contractor during performance of this Contract, performance of the Contract, and/or compliance with Contract procedures, or should Contractor otherwise seek extra time or compensation FOR ANY REASON WHATSOEVER, then Contractor shall first follow procedures set forth in the Contract (including but not limited to other Articles of this Document 00 7200 and Section 01 2600.) If a dispute remains, then Contractor shall give written notice to City that expressly invokes this Article 12. City shall decide the issue in writing within 15 calendar days; and City's written decision shall be final and conclusive. If Contractor disagrees with City's decision, or if Contractor contends that City failed to provide a decision timely, then Contractor's SOLE AND EXCLUSIVE REMEDY is to promptly file a written claim setting forth Contractor's position as required herein.

12.02 Form And Contents Of Claim

- A. Contractor's written claim must identify itself as a "Claim" under this Article 12 and must include the following: (1) a narrative of pertinent events; (2) citation to contract provisions; (3) theory of entitlement; (4) complete pricing of all cost impacts; (5) a time impact analysis of all time delays that shows actual time impact on the critical path; (6) documentation supporting items 1 through 5; a verification under penalty of perjury of the claim's accuracy. The Claim shall be submitted to City within thirty (30) calendar days of receiving City's written decision, or the date Contractor contends such decision was due, and shall be priced like a change order according to Section 01 2600, and must be updated monthly as to cost and entitlement if a continuing claim. Routine contract materials, for example, correspondence, RFI, Change Order requests, or payment requests shall not constitute a claim. Contractor shall bear all costs incurred in the preparation and submission of a claim.

12.03 Administration During/After Claim Submission

- A. City may render a final determination based on the Claim or may in its discretion conduct an administrative hearing on Contractor's claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further evidence or analysis requested by City prior to rendering a final determination. Should City take no action on the Claim within 45 calendar days of submission, it shall be deemed denied.
- B. Notwithstanding and pending the resolution of any claim or dispute, Contractor shall diligently prosecute the disputed work to final completion in accordance with City's determination.
- C. After their submission, claims less than \$375,000 shall also be subject to the Local Agency Disputes Act.

12.04 Compliance

- A. The provisions of this Article 12 constitute a non-judicial claim settlement procedure that, pursuant to Section 930.2 of the California Government Code, shall constitute a condition precedent to submission of a valid Government Code Claim under the California Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a claim. Any claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the claims procedure herein and the previous dispositions under Paragraph 12.3 above of the claims asserted. Pursuant to Government Code Section 930.2, the one-year period in Government Code section 911.2 shall be reduced to 150 calendar days from either accrual of the cause of action, substantial completion or termination of the contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.
- B. Failure to submit and administer claims as required in Article 12 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) or issue(s) not raised in a timely protest and timely claim submitted under this Article 12 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.
- C. City shall not be deemed to waive any provision under this Article 12, if at City's sole discretion, a

claim is administered in a manner not in accord with this Article 12. Waivers or modifications of this Article 12 may only be made a signed change order approved as to form by legal counsel for both City and Contractor; oral or implied modifications shall be ineffective.

ARTICLE 13 – UNDERGROUND CONDITIONS

13.01 Contractor To Locate Underground Facilities.

- A. During construction, Contractor shall comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part: "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two working days, but no more than 14 calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."
- B. Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching work, Contractor shall provide City with copies of all USA records secured by Contractor. Contractor shall advise City of any conflict between information provided in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents.
- C. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Document 00 3132 (Geotechnical Data and Existing Conditions), the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify City and the utility owner, in writing, of its discovery.

13.02 Contractor To Protect Underground Facilities.

- A. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such Underground Facilities in service where appropriate; shall repair any damage to them caused by the Work; and shall incorporate them into the Work, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations.
- B. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground Facilities that are to remain in service and other significant known underground installations indicated by the Underground Facilities Data. Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, all such utilities or installations that are to remain and that are subject to damage. If additional utilities whose locations are unknown are discovered, Contractor shall immediately report to City for disposition of the same. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Document 00 7200.
- C. If during construction, an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by City for bidding or in information on file at USA or otherwise reasonably available to Contractor, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven calendar days), and prior to performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and give written notice to that owner and to City. During such time, Contractor shall be responsible for the

safety and protection of such Underground Facility.

- D. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, but not limited to, information made available for bidding and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, but not limited to, and by way of example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordination of the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.
- E. Consistent with California Government Code §4215, as between City and Contractor, City will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or information made available for bidding. City will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or information made available for bidding with reasonable accuracy, and equipment on the Project necessarily idled during such Work. Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay was caused by the failure of City or the utility to provide for removal or relocation of such utility facilities.

13.03 Concealed Or Unknown Conditions

- A. If either of the following conditions is encountered at Site when digging trenches or other excavations that extend deeper than four feet below the surface, Contractor shall give a written Notice of Differing Site Conditions to City promptly before conditions are disturbed, except in an emergency as set forth in this Document 00 7200, and in no event later than seven calendar days after first observance of:
 - 1. Subsurface or Latent physical conditions which differ materially from those indicated in the Contract Documents; or
 - 2. Unknown physical conditions of an unusual nature or which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.
- B. In response to Contractor's Notice of Differing Site Conditions under this Paragraph, City will investigate the identified conditions, and if they differ materially and cause increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, City will negotiate the appropriate change order following the procedures set forth in the Contract Documents. If City determines that physical conditions at the Site are not Latent or are not materially different from those indicated in Contract Documents or that no change in terms of the Contract Documents is justified, City will so notify Contractor in writing, stating reasons (with Contractor retaining its rights under Article 12 of this Document 00 7200.)
- C. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed Latent or materially different Site conditions (whether above or below grade) if Contractor knew or should have known of the existence of such conditions at the time Contractor submitted its Bid, failed to give proper notice, or relied upon information, conclusions, opinions or deductions of the kind that the Contract Documents preclude reliance upon.
- D. Regarding Underground Facilities, Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that is owned and was built by City only where the Underground Facility:
 - 1. Was not shown or indicated in the Contract Documents or in the information supplied for bidding purposes or in information on file at USA; and
 - 2. Contractor did not know of it; and
 - 3. Contractor could not reasonably have been expected to be aware of it or to have anticipated it from the information available. (For example, if surface conditions such as

pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, then an increase in the Contract Sum or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated in the Contract Documents, in the information supplied to Contractor for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor.)

- E. Contractor shall bear the risk that Underground Facilities not owned or built by City may differ in nature or locations shown in information made available by City for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor. Underground Facilities are inherent in construction involving digging of trenches or other excavations on City's Project, and Contractor is to apply its skill and industry to verify the information available.
- F. Contractor's compensation for claimed Latent or materially different Site conditions shall be limited to the actual, reasonable, incremental increase in cost of that portion of the Work, resulting from the claimed Latent or materially different Site conditions. Such calculation shall take into account the estimated value of that portion of the Work and the actual value of that portion of the Work, using for guidance Contractor's or its subcontractor's bid amount and actual amounts incurred for that portion of the Work and the reasonable expectation (if any) of differing or difficult site conditions in the Work area based on the available records and locale of the Work. For example, if Contractor excavates in an area unexpected, then such costs would be recoverable entirely; while if Contractor extends an existing excavation, then such costs would be recoverable if the resulting excavation costs in that work area exceeded the reasonable expectations therefore.

13.04 Notice Of Hazardous Waste Or Materials Conditions

- A. Contractor shall give a written Notice of Hazardous Materials Condition to City promptly, before any of the following conditions are disturbed (except in an emergency as set forth in this Document 00 7200), and in no event later than 24 hours after first observance of any:
 - 1. Material that Contractor believes may be hazardous waste or hazardous material, as defined in Section 25117 of the Health and Safety Code (including, without limitation, Asbestos, lead, PCBs, petroleum and related hydrocarbons, and radioactive material) that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law ("hazardous material"); or
 - 2. Other material that may present an imminent substantial danger to persons or property exposed thereto in connection with Work at the Site ("other materials").
- B. Except as otherwise provided in the Contract Documents or as provided by applicable law, Contractor shall not be required to give any notice for the disturbance or observation of any such hazardous materials or other materials where such matter is disturbed or observed as part of the scope of Work under the Contract Documents (such as hazardous waste or hazardous material investigation, remediation or disposal activities which are identified as the subject of Work under the Contract Documents), where Contractor complies with all requirements in the Contract Documents and applicable law respecting such materials.
- C. Contractor's Notice of Hazardous Materials Condition shall indicate whether the hazardous materials or other materials were shown or indicated in the Contract Documents to be within the scope of Work, and whether the hazardous materials or other materials were brought to the Site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible.
- D. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials if:
 - 1. Contractor knew of the existence of such hazardous materials or other materials at the time Contractor submitted its Bid; or
 - 2. Contractor should have known of the existence of such hazardous material or other materials as a result of its having the responsibility to obtain additional or supplementary examinations, investigation, explorations, tests, studies, and data concerning the conditions at or contiguous to the Site prior to submitting its Bid; or
 - 1. Contractor failed to give the written notice within the required timeframe set forth below.
- E. If City determines that conditions involve hazardous materials or other materials and that a

change in Contract Document terms is justified, City will issue either a Request for Proposal or Construction Change Directive under the procedures described in the Contract Documents. If City determines that conditions do not involve hazardous materials or other materials or that no change in Contract Document terms is justified, City will notify Contractor in writing, stating the reasons for its determination.

- F. In addition to the parties' other rights under this Document 00 7200, if Contractor does not agree to resume Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, City may order the disputed portion of Work deleted from the Work, or performed by others, or City may invoke its right to terminate Contractor's right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant.
- G. If Contractor does not agree with any City determination of any adjustment in the Contract Sum or Contract Time under this Article, Contractor may make a claim as provided in Article 12 of this Document 00 7200.

ARTICLE 14 – LEGAL AND MISCELLANEOUS

14.01 Laws And Regulations

- A. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall protect and indemnify City and its officers, employees, consultants and agents against any claim or liability, including attorney's fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders.

14.02 Permits And Taxes

- A. Contractor shall procure all permits and licenses applicable to the Work (including environmental matters to the extent applicable); pay all charges and fees, including fees for street opening permits; comply with, implement and acknowledge effectiveness of all permits; initiate and cooperate in securing all required notifications or approvals therefore; and give all notices necessary and incident to due and lawful prosecution of Work, unless otherwise provided herein. City will pay applicable building permits, sanitation and water fees for the completed construction, except as otherwise provided in the Contract Documents. Contractor shall pay all sales and/or use taxes levied on materials, supplies, or equipment purchased and used on or incorporated into Work, and all other taxes properly assessed against equipment or other property used in connection with Work, without any increase in the Contract Sum. Contractor shall make necessary arrangements with proper authorities having jurisdiction over roads, streets, pipelines, navigable waterways, railroads, and other works in advance of operations, even where City may have already obtained permits for the Work.

14.03 Communications And Information Distribution

- A. All communications recognized under the Contract Documents shall be in writing, in the form of a serialized document, by type of communication. For example, RFI's shall be serialized beginning with RFI No. 1; payment applications shall be serialized beginning with Payment Application No. 1, submittals shall be serialized per specification section and transmitted with transmittal sheets beginning with Transmittal No. 1; and correspondence shall be serialized beginning with letter No. 1. Contractor may propose other record management and identification systems or protocols, intended to facilitate orderly transmittal of project information, storage and retrieval of such information, which City will review consistent with these stated objectives, and accept or reject in its sole discretion.
- B. Documents Requiring Signatures. All documents requiring signatures for approval prior to implementing action, as stipulated in other portions of Contract Documents, shall require a manually signed, serialized letter delivered to the other party at its address for notice otherwise specified in the Contract Documents, either personally or by mail.

- C. Electronic data transfer of such correspondence will serve to expedite preliminary concurrence of information, only. Receipt of "hard copy" signature on forms is required prior to implementing action or work as the conditions may require. For example, change orders and authorizations for extra cost, require signatures. A party may acknowledge receipt of PDF copies of required correspondence by e-mail, but in the absence of such acknowledgment, mail or personal delivery is required.
- D. All emails shall be copied to City's and Contractor's Project Representative. City reserves the right to preclude e-mail communication, in whole or in part, as Project needs may require. Communication between City and Contractor shall not be via Twitter, Facebook, or other types of instant text message systems. Any such communications shall be inadmissible for any purpose related to this Contract.

14.04 Suspension Of Work

- A. City may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as City may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in Section 01 2600 (Modification Procedures). No adjustment shall be made to extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible.

14.05 Termination Of Contract For Cause

- A. The Contractor shall be in default of the Contract Documents and City may terminate the Contractor's right to proceed under the Contract Documents, for cause, in whole or in part, should the Contractor commit a material breach of the Contract Documents and not cure such breach within ten (10) calendar days of the date of notice from City to the Contractor demanding such cure; or, if such breach is curable but not curable within such ten (10) day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for the Contractor to avail itself of a time period in excess of 10 calendar days, the Contractor must provide City within the ten (10) day period with a written plan acceptable to City that demonstrates actual resources, personnel and a schedule to promptly to cure said breach, and then diligently commence and continue such cure according to the written plan).
- B. In the event of termination by City for cause as provided herein, the Contractor shall deliver to City possession of the Work in its then condition, including but not limited to, all designs, engineering, Project records, cost data of all types, plans and specifications and contracts with vendors and subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. The Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the date of such termination to comply with the provisions of the Contract Documents. The provisions of this Section shall not be interpreted to diminish any right which City may have to claim and recover damages for any breach of the Contract Documents or otherwise, but rather, the Contractor shall compensate City for all loss, cost, damage, expense, and/or liability suffered by City as a result of such termination and/or failure to comply with the Contract Documents.
- C. In the event a termination for cause is later determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, and the Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor claim arising out of a termination for cause shall be made in accord with Article 12 herein. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by the Contractor.

14.06 Termination Of Contract For Convenience

- A. City may terminate performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever City shall determine that termination is

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

- B. Contractor shall comply strictly with City's direction regarding the effective date of the termination, the extent of the termination, and shall stop work on the date and to the extent specified.
- C. Contractor shall be entitled to a total payment on account of the Contract work so terminated measured by (i.) the actual cost to Contractor of Work actually performed, up to the date of the termination, with profit and overhead limited to twelve percent (12%) of actual cost of work performed, up to but not exceeding the actual contract value of the work completed as measured by the Schedule of Values and Progress Schedule, (ii.) offset by payments made and other contract credits. In connection with any such calculation, however, City shall retain all rights under the Contract Documents, including but not limited to claims, indemnities, or setoffs.
- D. Under no circumstances may Contractor recover legal costs of any nature, nor may Contractor recover costs incurred after the date of the termination.

14.07 Contingent Assignment Of Subcontracts

- A. Contractor hereby assigns to City each Subcontract for a portion of the Work, provided that:
 - 1. The assignment is effective only after City's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) as set forth herein.
 - 2. The assignment is effective only for the Subcontracts which City expressly accepts by notifying the Subcontractor in writing;
 - 3. The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 00 6113.13 (Construction Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;
 - 4. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense (except as otherwise provided in this Document 00 7200), sign all instruments and take all actions reasonably requested by City to evidence and confirm the effectiveness of the assignment in City; and
 - 5. Nothing in this Paragraph shall modify or limit any of Contractor's obligations to City arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

14.08 Remedies And Contract Integration

- A. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter claims, disputes and other matters in question between City and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the applicable court of competent jurisdiction located in the State and County where the Project is located. All City remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances City shall have any and all other equitable and legal rights and remedies which it would have according to law.
- B. The Contract Documents, any Contract Modifications and Change Orders, shall represent the entire and integrated agreement between City and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties' agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written Modifications. City and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written Modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications; the parties are not and will not rely on any other

information, which shall be inadmissible in any proceeding to enforce these documents.

- C. Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.
- D. Neither acceptance of the whole or any part of Work by City nor any verbal statements on behalf of City or its authorized agents or representatives shall operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to City herein nor any right to damages provided in the Contract Documents.

14.09 Interpretation.

- A. Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).
- B. Contract Documents shall not be construed to create a contractual relationship of any kind between (1) Project Manager or any City's representative and Contractor; (2) City and/or its Representatives and a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (3) between any persons or entities other than City and Contractor.

14.10 Patents

- A. Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work. Contractor shall defend, indemnify and hold harmless City and each of its officers, employees, consultants and agents, including, but not limited to, the Board and each City's Representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney's fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnities include but are not limited to any and all license fees, whether such fees are agreed by any indemnitee or ordered by a court or administrative body of any competent jurisdiction.

14.11 Substitution For Patented And Specified Articles

- A. Except as noted specifically in the instructions to Bidders or in Contract Documents, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words "or Approved Equal" and Contractor may offer any substitute material or process that Contractor considers "equal" in every respect to that so designated and if material or process offered by Contractor is, in opinion of City, Equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00 6325 (Substitution Request Form) as provided in Document 00 2113 (Instructions to Bidders). A substitution will be approved only if it is a true "or equal" item in every aspect of its design and quality, including but not limited to its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

14.12 Interest Of Public Officers

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

14.13 Limit Of Liability

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

ARTICLE 15 – WORKING CONDITIONS AND PREVAILING WAGES**15.01 Use Of Site/Sanitary Rules**

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

15.02 Protection Of Work, Persons, And Property

- A. Contractor shall be responsible for initiating, maintaining and supervising all safety and site security precautions and programs in connection with Work, and shall develop and implement a site security and safety plan throughout construction. Contractor shall comply with all safety requirements specified in any safety program established by City, or required by state, federal or local laws and ordinances. Contractor shall be responsible for all theft or damage to Work, property or structures, and all injuries to persons, either on the Site or constituting the Work (e.g., materials in transit), arising from the performance of Work of the Contract Documents from a cause.

- B. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.
- C. Contractor shall remedy all damage, injury or loss to any property referred to above in this Article, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work or anyone for whose acts any of them may be liable. Contractor's duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. City and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor's Work.
- D. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- E. City may, at its option, retain such moneys due under the Contract Documents as City deems necessary until any and all suits or claims against Contractor for injury to persons or property shall be settled and City receives satisfactory evidence to that effect.
- F. Work within the right-of-way lines of the city and/or City and/or State shall be done in accordance with the standards and specifications of the controlling agency. Permit for such work shall be obtained and paid for by the Contractor before executing the work within such right-of-ways.

15.03 Responsibility For Safety And Health

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

15.04 Emergencies

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

15.05 Use Of Roadways And Walkways

- A. Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for

vehicular or pedestrian traffic. Before beginning any interference and only with City's prior concurrence, Contractor may provide detour or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of these temporary facilities.

15.06 Nondiscrimination

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

15.07 Prevailing Wages And Working Hours

- A. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (1) work of a similar character in the locality in which the Work is performed and (2) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and City to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.
- B. Contractor shall forfeit, as a penalty to City, Fifty Dollars (\$50.00) for each laborer, workman, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, workman or mechanic is paid less than the said stipulated rates for any Work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the California Labor Code. The sums and amounts which shall be forfeited pursuant to this Paragraph and the terms of the California Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 00 7200 and the California Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by City. The Labor Commissioner pursuant to California Labor Code §1775 shall determine the final amount of forfeiture.
- C. Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the California Labor Code.
- D. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation, California Labor Code §§ 1776 and 1810-1815. Failure to so comply shall constitute a default under this Contract.
- E. Contractor and its Subcontractors shall be responsible for compliance with Labor Code §§ 1810-1815.
 - 1. Eight hours of labor performed in execution of the Contract constitutes a legal day's work. The time of service of any workman employed on the Project is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week.
 - 2. Contractor and its Subcontractors shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the Project. The record shall be kept open at all reasonable hours to the inspection City and to the Division of Labor Standards Enforcement.

3. Contractor or its Subcontractors shall, as a penalty to City, forfeit twenty-five dollars (\$25) for each worker employed in the execution of the Contract Documents by the respective Contractor or Subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Labor Code §§ 1810-1815.
 4. Work performed on the Project by employees of Contractor or its Subcontractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.
- F. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776.
1. Contractor and Subcontractors must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the Work of the Contract Documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.
 2. The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor as required by Labor Code Section 1776.
 - a. Contractor shall inform City of the location of records enumerated above, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
 - b. Contractor or Subcontractor has 10 calendar days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that the Contractor or Subcontractor fails to comply with the ten-day period, he or she shall, as a penalty to City on whose behalf the contract is made or awarded, forfeit \$25.00 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this Paragraph due to the failure of a Subcontractor to comply with this Paragraph.
 3. Contractor shall also deliver certified payrolls to City with each Application for Payment as set forth above in this Document 00 7200 (General Conditions).

15.08 Environmental Controls

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

15.09 Shoring Safety Plan

- A. Any conflict between this Paragraph and Division 2 of the Specifications shall be resolved in favor of the most stringent requirement.
- B. At least five calendar days in advance of any excavation five feet or more in depth, Contractor shall submit to City a detailed plan showing the shoring, bracing and sloping design (including calculations) and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by California Labor Code §6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.

- C. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. City's acceptance of any drawings showing the shoring or bracing design or Work schedule shall not relieve Contractor of its responsibilities under this Paragraph.
- D. Appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system to be used depending on local soil type, water table, stratification, depth, etc.

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DOCUMENT 00 7201

SUPPLEMENTAL GENERAL CONDITIONS

[OPTIONAL]

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DOCUMENT 00 7316**SUPPLEMENTARY CONDITIONS – INSURANCE AND INDEMNIFICATION****ARTICLE 1 – INSURANCE**

1.01 At or before the date specified in Document 00 2113 (Instructions to Bidders), Contractor shall furnish to City of Berkeley (“City”) satisfactory proof that Contractor has taken out for the entire period covered by the Contract the following classes of insurance in the form and with limits and deductibles specified below, unless otherwise specified in Contract Documents:

- A. Comprehensive General Liability Insurance covering claims for personal injury, bodily injury and property damage arising out of the Work and in a form providing coverage not less than that of a Standard Commercial General Liability Insurance policy (“Occurrence Form”). Such insurance shall provide for all operations and include independent contractors, products liability, completed operations for one year after Final Completion and acceptance of the final payment for the Work, contractual liability, and coverage for explosion, collapse, and underground hazards. The limits of such insurance shall not be coverage of less than \$2,000,000 each occurrence, \$2,000,000 general aggregate limit, and \$2,000,000 aggregate for products and completed operations, with defense costs payable in addition to policy limits. The policies shall be endorsed to provide Broad Form Property Damage Coverage.
- B. Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired vehicles. Such insurance shall provide coverage not less than the standard Comprehensive Automobile Liability policy with limits not less than \$2,000,000 each occurrence Bodily Injury, and \$2,000,000 each occurrence Property Damage.
- C. All-Risk Course of Construction Insurance including damage to property owned by City, Contractor or third parties caused by fire. Insurance shall be in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible shall not exceed 25,000. Each loss shall be borne by Contractor.
- D. Workers’ Compensation Insurance for all persons whom the Contractor may employ in carrying out Work contemplated under Contract Documents, in accordance with the Act of Legislature of State of California, known as “Workers’ Compensation Insurance and Safety Act,” approved May 26, 1913, and all acts amendatory or supplemental thereto, in the statutory amount. Workers’ Compensation Insurance is \$1,000,000 each accident, with defense cost payable in addition to policy limits.

1.02 All policies of insurance shall be placed with insurers acceptable to City. The insurance underwriter(s) for all insurance policies except Workers’ Compensation shall have an A. M. Best Company rating of A-, VIII or better, unless otherwise specified in Contract Documents. Required minimum amounts of insurance may be increased should conditions of Work, in opinion of City, warrant such increase. Contractor shall increase required insurance amounts upon direction by City.

1.03 Required Endorsements: The policies required under Document 00 7200 (General Conditions) and this Document 00 7316 shall be endorsed as follows:

- A. City of Berkeley, its officers, agents, volunteers, consultants, and employees shall be named as additional insureds, but only with respect to liability arising out of the activities of the named insured, and there shall be a waiver of subrogation as to each named and additional insured.
- B. Each such policy shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limit of the insurance company’s liability required hereunder. Should any of the policies identified herein contain a “cross-suits” exclusion, such exclusion must not apply to any additional insureds.
- C. Written notice of cancellation or of any limits reduction change in said policy shall be mailed to the City thirty (30) calendar days in advance of the effective date thereof, and ten (10) calendar days

- written notice to the same in advance of payment of any insurance claims under such policies to any person, firm or entity.
- D. Insurance shall be primary insurance and no other insurance or self-insured retention carried or held by any named or additional insureds shall be called upon to contribute to a loss covered by insurance for the named insured.
- 1.04** Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to City (Attention: Project Manager and the Construction Manager) at the address listed in Document 00 5200 (Agreement), 30 calendar days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Written notice of cancellation for non-payment shall be mailed within 10 calendar days of cancellation.
- 1.05** Certificates of insurance and endorsements shall have clearly typed thereon City Specification Number, and Title of Project of Contract Documents. Contractor shall maintain insurance in full force and effect during entire period of performance of Contract Documents.
- 1.06** Contractor shall keep insurance in force during warranty and guarantee periods, except that Contractor may discontinue All-Risk Course of Construction Insurance after Final Payment. At time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during requested additional period of time. Upon City's request, Contractor shall submit to City, within 30 calendar days, copies of the actual insurance policies or renewals or replacements.
- 1.07** Contractor shall pay all insurance premiums, including any charges for required waivers of subrogation or the endorsement of additional insureds. If Contractor fails to maintain insurance, City may take out comparable insurance, and deduct and retain amount of premium from any sums due Contractor under Contract Documents.
- 1.08** If injury occurs to any employee of Contractor, Subcontractor or sub-subcontractor for which the employee, or the employee's dependents in the event of employee's death, is entitled to compensation from City under provisions of the Workers' Compensation Insurance and Safety Act, as amended, or for which compensation is claimed from City, City may retain out of sums due Contractor under Contract Documents, amount sufficient to cover such compensation, as fixed by the Act, as amended, until such compensation is paid, or until it is determined that no compensation is due. If City is compelled to pay compensation, City may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse City.
- 1.09** Nothing herein shall be construed as limiting in any way the extent to which Contractor or any Subcontractor may be held responsible for payment of damages resulting from their operations.
- 1.10** All Subcontractors shall maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work unless otherwise indicated in Contract Documents, and Contractor shall cause the Subcontractors to furnish proof thereof to City within ten calendar days of City's request.
- 1.11** The following provisions apply to any licensed professional engaged by Contractor to perform portions of the Work ("Professional").
- A. Each Professional shall maintain the following insurance, unless otherwise specified in Contract Documents:
- B. Professional Liability Insurance, insuring against professional errors and omissions arising from Professional's Work on the Project, in an amount not less than \$2,000,000 combined single limit for each occurrence. If Professional cannot provide an occurrence policy, Professional shall provide insurance covering claims made as a result of performance of Work on this Project and shall maintain such insurance in effect for not less than two years following Final Completion of the Project.
- C. Professional shall satisfy all other provisions of this Document 00 7316 relating to that insurance, including without limitation providing required insurance certificates (containing the required

endorsements) before commencing its Work on the Project.

ARTICLE 2 – RESPONSIBILITY OF CONTRACTOR AND INDEMNIFICATION

- 2.01** City and each of its officers, employees, consultants and agents including, but not limited to, the Board, Project Manager and Construction Manager and each City's Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person; or damage to property resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence, attributable to performance or character of the Work, and Contractor releases all of the foregoing persons and entities from any and all such claims.
- 2.02** To the furthest extent permitted by law (including without limitation California Civil Code §2782), Contractor shall assume defense of, and indemnify and hold harmless, City and each of its officers, employees, consultants and agents, including but not limited to the Board, Project Manager and Construction Manager and each City's Representative, from claims, suits, actions, losses and liability of every kind, nature and description, including but not limited to claims and fines of regulatory agencies and attorney's fees and consultant's fees, directly or indirectly arising out of, connected with or resulting from performance of the Work, failure to perform the Work, or condition of the Work which is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence.
- 2.03** With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity against City and each of its officers, employees, consultants and agents including, but not limited to City, the Board, Project Manager and Construction Manager and each City's Representative. City shall provide timely notice to Contractor of any third-party claim relating to the Contract Documents, in accordance with Section 9201 of the California Public Contract Code.
- 2.04** Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them.
- 2.05** To the furthest extent permitted by law (including, without limitation, Civil Code §2782), the indemnities, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of Contract, negligence (active or passive), fault or strict liability of the party(ies) indemnified, released, or limited in liability, and shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents. If Contractor fails to perform any of these defense or indemnity obligations, City may in its discretion back charge Contractor for City's costs and damages resulting therefrom and withhold such sums from progress payments or other Contract moneys which may become due.
- 2.06** The indemnities in the Contract Documents shall not apply to any indemnified party to the extent of its sole negligence or willful misconduct; nor shall they apply to City or other indemnified party to the extent of its active negligence.

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DOCUMENT 00 7317**SUPPLEMENTARY CONDITIONS – CITY OF BERKELEY CONTRACTING POLICIES****ARTICLE 1 – GENERAL****1.01 DESCRIPTION**

- A. This document includes requirements which supplement the sections of the General Conditions.

1.02 PROHIBITED DISCRIMINATION. The following paragraphs shall be added to the General Conditions as a new Article 16.A, and, with the additions set forth in paragraphs 1.03 through 1.08, below, shall constitute a new Section 16 of Document 00 7200, General Conditions, entitled “16: City of Berkeley Contracting Policies”.

“16. A PROHIBITED DISCRIMINATION: During prosecution of the Work to be done under the Contract, Contractor shall comply with the provisions of Berkeley Municipal Code (“B.M.C.”) Chapter 13.26, including, but not limited to, the following:

1. Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, ancestry, national origin, age (over 40), sex, pregnancy, marital status, disability, sexual orientation or AIDS.
2. Contractor shall permit the City access to records of employment, employment advertisements, application forms, EEO-1 forms, affirmative action plans and any other documents which, in the opinion of the City, are necessary to monitor compliance with this non-discrimination provision. In addition, Contractor shall submit forms supplied by the City to monitor this non-discrimination provision.”

1.03 CONFLICTS OF INTEREST PROHIBITED. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

“16. B CONFLICTS OF INTEREST PROHIBITED:

1. In accordance with Government Code section 1090, Berkeley City Charter section 36 and B.M.C. Chapter 3.64, neither Contractor nor any employee, officer, director, partner or member of Contractor or immediate family member of any of the preceding, shall have served as an elected officer, an employee, or a City board, committee or commission member, who has directly or indirectly influenced the making of the Agreement.
2. In accordance with Government Code section 1090 and the Political Reform Act, Government Code section 87100 *et seq.*, no person who is a director, officer, partner, trustee, employee or consultant of the Contractor, or immediate family member of any of the preceding, shall make or participate in a decision made by the City or a City board, commission or committee, if it is reasonably foreseeable that the decision will have a material effect on any source of income, investment or interest in real property of that person or Contractor.
 - a. Interpretation of this section shall be governed by the definitions and provisions used in the Political Reform Act, Government Code section 87100 *et seq.*, its implementing regulations, manuals and codes, Government Code section 1090, Berkeley City Charter section 36 and B.M.C. Chapter 3.64.”

- 1.04** NUCLEAR FREE BERKELEY ORDINANCE. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

“16. C NUCLEAR FREE BERKELEY ORDINANCE:

1. Contractor agrees to comply with B.M.C. Chapter 12.90, the Nuclear Free Berkeley Act, as amended from time to time.”

- 1.05** CONTRACTUAL RELATIONS WITH PROHIBITED ENTITIES. The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section:

“16. D CONTRACTUAL RELATIONS WITH PROHIBITED ENTITIES

1. OPPRESSIVE STATES

- a. In accordance with Resolution No. 59,853-N.S. (Appendix 00812-A), Contractor certifies that it has no contractual relations with, and agrees during the term of this agreement to forego contractual relations to provide personal services to, the following entities:
 1. The governing regime in any Oppressive State.
 2. Any business or corporation organized under the authority of the governing regime of any Oppressive State.
 3. Any individual, firm, partnership, corporation, association, or any other commercial organization, and including parent-entities and wholly-owned subsidiaries (to the extent that their operations are related to the purpose of its contract with the City), for the express purpose of assisting in business operations or trading with any public or private entity located in any Oppressive State.
- b. Appendix A to Resolution No. 59,853-N.S., and Resolution No. 60,382-N.S. and 70,606-N.S. designates the following as Oppressive States for the purposes of this Contract:
 1. Tibet Autonomous Region and the provinces of Amdo, Kham, and U-Tsang; and Burma (Myanmar)
- c. Contractor’s failure to comply with this section shall constitute a default of this Contract and City may terminate the Contractor’s right to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05.
 1. In the event that the City terminates Contractor due to a default under this provision, City may deem Contractor a non-responsible bidder for five (5) years from the date this Contract is terminated.”

- 1.06** REQUIRED AND PROHIBITED WORK MATERIALS. The following paragraphs are added to Document 00 7200, General Conditions, as a new Section:

“16. E REQUIRED AND PROHIBITED WORK MATERIALS

1. RECYCLED PAPER

- a. If Contractor is required by this Agreement to prepare a written report or study, Contractor shall use recycled paper for said report or study when such paper is available at a cost of not more than ten percent more than the cost of virgin paper, and when such paper is available at the time it is needed. For the purposes of this Agreement, recycled paper is paper that contains at least 50% recycled product. If recycled paper is not available, Contractor shall use white paper. Written reports or studies prepared under this Agreement shall be printed on both sides of the page whenever practical.

TROPICAL HARDWOODS

- a. Contractor shall comply with the terms of Resolution No. 58,291-N.S. (Appendix 00812-B) prohibiting the use of any tropical hardwood or wood product, including, but not limited to, those enumerated in Resolution No. 58,291-N.S. Contractor must submit, with its bid, a statement Tropical Hardwood Disclosure form.
- b. Except as expressly permitted by the application of Sections 3.B and 4.B. of Resolution No. 58,291-N.S., Contractor shall not provide any items to the City in performance of this contract which are tropical hardwoods or tropical wood products.
- c. Contractor's failure to comply with this section shall constitute a default of this Agreement and Contractor agrees that City may take any of the following actions:
 1. terminate the Contractor's right to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05;
 2. withhold funds due the Contractor under any contract with the City;
 3. order revision of the Contract Documents based upon a material breach of Contract Documents provisions or pertaining to representations made in bidding, execution or performance of the Contract Documents;
 4. disqualify the Contractor from eligibility for providing commodities or services to the City for a period not to exceed five (5) years, with a right to review and reconsideration by the City after two (2) years upon a showing of corrective action, indicating violations are not likely to recur.
- d. Notwithstanding Article 4 of the Agreement, Contractor acknowledges and agrees that its failure to comply with this requirement justifies the imposition of liquidated damages in an amount equal to Contractor's net profit, or five percent (5%) of the total contract amount, whichever is greater.
 1. Liquidated damages under this provision shall be payable to the City upon demand and may be set off against any monies due to the Contractor from any contract with the City.

3. VIRGIN REDWOOD

- a. Contractor agrees to comply with the City Council's October 29, 1996, directive not to purchase virgin redwood for the prosecution of the work to be done under this Contract and in its place purchase and use:
 1. Redwood that has been previously used or;
 2. Certified, sustainable-harvested redwood as the preferred alternative to virgin

and non-certified redwood, and not pressure-treated lumber of other species as an alternative to redwood.”

4. TREATED WOOD

- a. Contractor shall comply with the terms of Resolution No. 61,724-N.S. (Appendix 00812-E) prohibiting the use of Pentachlorophenol, arsenic and creosote treated wood. No such wood shall be used by the contractor in this or any other City project without the express written consent of the City Council.

- 1.07 FIRST SOURCE HIRING REQUIREMENT.** The following paragraphs shall be added to Document 00 7200, General Conditions, as a new Section if the contract exceeds \$100,000 but is less than \$500,000:

“16. F FIRST SOURCE HIRING REQUIREMENT

1. Contractor, and any subcontractors, shall utilize the City's First Source Construction Program under the terms set forth in the First Source specifications. (Appendix 00812-C).
 - a. Under the First Source program, Contractor must employ, to the extent possible, a work force where no less than twenty-five percent of the work hours are performed by Berkeley residents, and fifty percent of all new hires are Berkeley residents, on a craft-by-craft basis.
 - b. To achieve the goals, Contractor may either:
 1. Utilize the City's First Source referral service, or
 2. Demonstrate a good faith effort to achieve the goals.”

OR

- 1.07 COMMUNITY WORKFORCE AGREEMENT.** The following paragraph shall be added to Document 00700 (General Conditions) as a new Section if the contract exceeds \$500,000.

“16.F COMMUNITY WORKFORCE AGREEMENT

1. Contractor and any subcontractor at any tier shall comply with the City's Community Workforce Agreement set forth in the Appendix 00812 C.
 - a. Under the Community Workforce Agreement, Contractor must sign and comply with the Agreement to be Bound prior to execution of the Contract.
 - b. Subcontractors at any tier must also sign and comply with an Agreement to be Bound prior to execution of their respective subcontracts.
 - c. The signing of an Agreement to be Bound is a condition precedent to entering into any contract for this project.”

- 1.08 EQUAL BENEFITS ORDINANCE.** The following paragraph shall be added to Document 00 7200 (General Conditions) as a new Section:

“16.G EQUAL BENEFITS ORDINANCE:

1. Contractor hereby agrees to comply with the provisions of the Berkeley Equal Benefits Ordinance, B.M.C. Chapter 13.29 (Appendix 00812-D). If Contractor is currently subject to the Berkeley Equal Benefits Ordinance, as indicated by the Equal Benefits Certification form, as contained in Document 00680, Contractor will be required to provide all eligible employees with City mandated equal benefits, as defined in B.M.C. Chapter 13.29, during the term of this contract, as well as comply with the terms enumerated herein.
2. If Contractor is currently or becomes subject to the Berkeley Equal Benefits Ordinance, Contractor agrees to provide the City with all records the City deems necessary to determine compliance with this provision. These records are expressly subject to the auditing terms described in Document 00 7200, General Conditions, Article 8.02.
3. If Contractor fails to comply with the requirements of this Article, City shall have the rights and remedies described in this Section, in addition to any rights and remedies provided by law or equity.
 3. Contractor's failure to comply with this Article shall constitute a material breach of the Contract, upon which City may terminate the Contractor's right to proceed with the Work pursuant to Document 00 7200, General Conditions, Article 14.05. In the event the City terminates the Contractor's right to proceed with the Work due to a default by Contractor under this Article, the City may deem Contractor a non-responsible bidder for not more than five (5) years from the date this Contract is terminated. In addition, at City's sole discretion, Contractor may be responsible for liquidated damages in the amount of \$50.00 per employee per day for each and every instance of violation of this Section. It is mutually understood and agreed that Contractor's failure to provide its employees with equal benefits will result in damages being sustained by City; that the nature and amount of these damages will be extremely difficult and impractical to fix; that the liquidated damages set forth herein is the nearest and most exact measure of damages for such breach that can be fixed at this time; and that the liquidated damage amount is not intended as a penalty or forfeiture for Contractor's breach. City may deduct any assessed liquidated damages from any payments otherwise due Contractor.

1.09 SANCTUARY CITY CONTRACTING: The following paragraph shall be added to Document 00 7200 (General Conditions) as a new Section:

"16. H SANCTUARY CITY ORDINANCE:

1. Contractor hereby agrees to comply with the provisions of the Sanctuary City Contracting Ordinance, B.M.C. Chapter 13.105. In accordance with this Chapter, Contractor agrees not to provide the U.S. Immigration and Customs Enforcement Division of the United States Department of Homeland Security with any Data Broker or Extreme Vetting Services as defined herein:
 - a. "Data Broker" means either of the following:
 - ii. The collection of information, including personal information about consumers, from a wide variety of sources for the purposes of reselling such information to their customers, which include both private-sector business and government agencies;

- iii. The aggregation of data that was collected for another purpose from that for which it is ultimately used.
- b. “Extreme Vetting” means data mining, threat modeling, predictive risk analysis, or other similar services. Extreme Vetting does not include:
 - i. The City’s computer-network health and performance tools;
 - ii. Cybersecurity capabilities, technologies and systems used by the City of Berkeley Department of Information Technology to predict, monitor for, prevent, and protect technology infrastructure and systems owned and operated by the City of Berkeley from potential cybersecurity events and cyber-forensic based investigations and prosecutions of illegal computer based activity.”

SCHEDULE OF APPENDENCES
TO
MODIFICATIONS TO GENERAL CONDITIONS

Schedule of Exhibits: (the following Exhibits are on file at the Berkeley City Clerk's office and will be made available on request to any interested party)

- A. City Council Resolution No. 59,853-N.S. (Re: Oppressive States).
- B. City Council Resolution No. 58,291-N.S. (Re: Tropical Hardwoods).
- C. City Council Resolution No. 61,724-N.S. (Re: Treated Wood).
- D. Berkeley Municipal Code, Chapter 13.29, Equal Benefits Ordinance
- ~~E. Specifications for City's First Source Construction Program, for contracts between \$100,000 and \$500,000. (Not Applicable to this project)~~
- E. Community Workforce Agreement and Agreement to be Bound for contract exceeding \$500,000.
- F. Sanctuary City Contracting Ordinance, B.M.C. Chapter 13.105.

END OF DOCUMENT

DOCUMENT 00 7319**SUPPLEMENTARY CONDITIONS – HEALTH AND SAFETY REQUIREMENTS;
HAZARDOUS MATERIALS****ARTICLE 1 – GENERAL****1.01 Summary**

- A. This document includes requirements as they apply to location, removal, remediation and disposal of hazardous materials and hazardous waste.

1.02 HAZARDOUS MATERIALS SURVEY

- A. Reference Section 01 1100, Part 1.15 for a list of available documents, including any Hazardous Materials Surveys, if available.
- B. Data regarding the locations of hazardous materials was obtained only for use of City and its consultants, contractors, and tenants for planning and design and are not part of Contract Documents.
- C. Bidders may rely on this data and information for general accuracy regarding the locations of potentially hazardous materials subject of the Work. City does not warrant and makes no representation regarding the completeness or thoroughness of any data or information regarding existing conditions or hazardous materials, including, but not limited to, quantities, characteristics, volumes, or associated structural features. Bidder represents and agrees that in submitting a Bid it is not relying on any such data, information or deductions.
- D. Before submitting a Bid, each Bidder shall be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.
- E. Bidders shall advise City in writing during the Bid period of any questions, suppositions, inferences or deductions Bidders may have for City's review and response. City has provided time in the period prior to bidding for Bidder to perform these investigations.
- F. During the Pre-Bid Site Visit(s), City will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 2113 (Instructions to Bidders) and Document 00 7200 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Bidder shall supply all equipment required to perform any investigations as each Bidder deems necessary. City has the right to limit the number of pieces of machinery operating at one time due to safety concerns.

1.03 Precedence of Documents

- A. Should any provision or requirement of any Contract Document conflict with another provision or requirement in the Contract Documents on subject matters of hazardous waste abatement, clean up, disposal, or required safety standards or methods, then the most stringent provision or requirement shall control.

1.04 Means and Methods of Construction

- A. Nothing contained in these Contract Documents or inferable therefrom shall be deemed or

construed (1) to make Contractor the agent, servant or employee of City, or (2) to create any partnership, joint venture or other association between City and Contractor.

1.05 Control of the Work

- A. City shall exercise administration of the Contract. The City may employ a consultant to assist. City reserves the right to assign or delegate to this consultant, or any other consultant ("Consultant") any or all of the responsibilities of the Architect/Engineer under the Contract Documents, or alternatively, to act as City's representative.
- B. Contractor shall cooperate with Consultant as directed by City. Consultant's duties may include observing the Contractor's health and safety program and practices, observing the abatement construction activities, observing the contractor's abatement work practices for compliance with the Contract Documents, observing the extent of material removed from each job site, reviewing payment requests, reviewing reports required by governmental or quasi-governmental agencies or the Contract Documents, and providing clearance tests after abatement is completed. No action, omission to act, approval, or failure to advise Contractor as to any matter by Consultant shall in any way relieve the Contractor from its responsibility for the performance of the Work in strict accordance with the Contract Documents and applicable Law.

1.06 Warranty, Guarantee and Inspection of Work.

- A. Contractor represents and warrants that it, its employees and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training and ability to comply fully with all applicable Law and contract requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to adequately address the actual or potential dangers of contract performance).
- B. Contractor represents and warrants that it, its employees and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state and other governmental and quasi-governmental requirements applicable to the Work.
- C. Contractor represents and warrants that it has studied carefully all requirements of the specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in this contract, and prior submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed project in full compliance with the contract requirements.
- D. City reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor contract requirements of safe and statutory compliant work methods and (where applicable) safe re-entry level air standards under State and Federal law upon completion of the job, and compliance of the work with periodic and final inspection of public and quasi-public entities having jurisdiction.
- E. Contractor acknowledges that City also has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement and post-abatement air monitoring, provided that City shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event City elects to perform these activities and tests, Contractor shall afford City ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these activities for tests by City in the Contract Sum and the Scheduled Completion Date. Contractor shall not be entitled to increases in the contract sum or any damages for delay in the event City elects to perform these activities and tests, provided any delays resulting therefrom are reasonable under the circumstances involved. Notwithstanding City's rights

granted by this paragraph, Contractor shall retain its own industrial hygiene consultant and shall have primary responsibility for collecting samples and perform all applicable, relevant or appropriate activities and tests including, but not limited to, pre-abatement, during abatement and post-abatement air monitoring, required or suggested by the Contract Documents, the Law, or both, and City reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work.

1.07 RECORDS

- A. Contractor shall obtain and maintain and shall furnish to City on completion of the Work, or at any other time requested by City, all necessary permits, licenses, approvals, authorizations, notifications, training certificates, respirator certificates, reports, correspondence, test results, air monitoring certificates, forms, medical records, medical certificates, notes and photographs of work conditions, approved shipping and disposal facility receipts, manifests, and all other documentation required by the Contract Documents or applicable Law, or both.
- B. Contractor shall provide City with copies of each such document as it is generated and shall, as a condition to final payment, provide City with a complete set of such documents (bound, organized and indexed) at the conclusion of the Work. Contractor shall keep and maintain in retrievable files true and correct copies of all such documents for a period of not less than thirty (30) years after final completion of the Work. City shall have the right to inspect or photocopy these records and, if Contractor should cease business operations, then it shall furnish these records to City.

1.08 Compliance with laws

- A. Contractor represents that it is familiar with shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state and local laws, statutes standards, rules, regulations and ordinances applicable to the Work (collectively, the "Law") relating to:
 - 1. the protection of the public health, welfare and environment;
 - 2. storage, handling or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;
 - 3. the generation, processing, treatment, storage, transport, disposal, destruction or other management of asbestos, PCB, lead, petroleum or hazardous waste materials or other waste materials of any kind; or,
 - 4. the protection of environmentally sensitive areas such as wetlands.
- B. Contractor has the sole responsibility for determining current waste storage, handling, transportation and disposal regulations for the jobsite and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable Law. City, may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.
- C. Contractor shall develop and implement a system acceptable to City to track hazardous waste from the site to disposals, including appropriate "Hazardous Waste Manifests" on the EPA form, so that City may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.
- D. Contractor shall provide City with the name and address of each waste disposal facility prior to any disposal, and City shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which City has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the general contractor.

1.09 Permits

- A. Before performing any of the Work, and at such other times as may be required by applicable Law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to City that it and any disposal facility (1) have obtained all required permits, approvals and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable Law, and (2) are in compliance with all such permits,

approvals and the like. For example, before commencing any work in connection with the Work involving asbestos-containing materials or PCB subject to regulation, Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to City. Contractor shall not conduct any Work involving asbestos-containing materials or PCB unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, bonds required by governmental or quasi-governmental authorities, fees, deposits, tap fees, offsite easements and asbestos and PCB disposal facilities necessary for the prosecution of the Work shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the Law bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying City in writing of such fact. If Contractor performs any Work contrary to the Law without such notice to City, it shall bear all costs arising therefrom.

- B. In the case of any permits or notices held in City's name or of necessity to be made in City's name, City shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for City's review and execution upon approval, all necessary applications, notices and other materials.

1.10 Indemnification and Termination

- A. To the extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement and disposal of hazardous waste. This includes liabilities connected to the selection and use of a waste disposal facility, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. 9601 et seq).
- B. Notwithstanding anything in Document 00 7200 to the contrary, City shall have an absolute right to terminate the Contractor's right to proceed with the Work for cause immediately, without ten calendar days notice and without an opportunity to cure, should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents or the Law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional and non-reckless failure to exercise reasonable care, then the procedures in Document 00 7200, Article 14.05, shall apply without modification.

1.11 Protection of Work, Persons and Property

- A. Contractor shall perform safe, expeditious and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal and disposal industry, the Law (as herein defined), and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the Law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.

END OF DOCUMENT

DOCUMENT 00 7380**APPRENTICESHIP PROGRAM****ARTICLE 1 – COMPLIANCE REQUIRED**

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

ARTICLE 2 – CERTIFICATION OF APPROVAL

- 2.01** California Labor Code §1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one *hour* of apprentices work for every five *hours* of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:
- A. When unemployment for the previous three month period in the area exceeds an average of 15 percent;
 - B. When the number of apprentices in training in the area exceeds a ratio of one to five;
 - C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or
 - D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

ARTICLE 3 – FUND CONTRIBUTIONS

- 3.01** Contractor is required to make contributions to funds established for administration of apprenticeship programs if Contractor employs registered apprentices or journeypersons in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

ARTICLE 4 – APPRENTICESHIP STANDARDS

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

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DOCUMENT 00 9113

ADDENDA

SPECIFICATION NO. 25-11684-C

CITY OF BERKELEY

PUBLIC SAFETY BUILDING JAIL AUTOMATION UPGRADES

2100 MARTIN LUTHER KING JR WAY

The following Addenda were issued, modifying the Project Manual:

Addendum No. 1, issued on **December 5, 2025**
Addendum No. 2, Issued on **December 16, 2025**
Addendum No. 3, Issued on **December 31, 2025**
Addendum No. 4, Issued on **January 27, 2026**

END OF DOCUMENT

ADDENDUM NO. 1

The bid documents for Specification No. 25-11684-C for the Corp Yard City Fleet EV Charger Project are amended as follows:

1-1. COVER PAGE

BID OPENING DATE: Tuesday, December 23, 2025

1-2. APPENDICES, DOCUMENT 00 0110 – TABLE OF CONTENTS

S. J. AMOROSO SHEET A4.02 "FIRST FLOOR REFLECTED CEILING PLAN"
ANGUS-HAMER NETWORKING SHEET A2.30 ROOF PLAN, 2013 ROOFING PROJECT
SECTION 07620 – SHEET ETAL FLASHING, 2013 ROOFING PROJECT

1-3. ARTICLE 1, DOCUMENT 00 1113 – NOTICE INVITING BIDS

Notice Inviting Bids: City of Berkeley ("City") will receive sealed Bids at City of Berkeley, Purchasing Manager's Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until 2:00 PM, **Tuesday, December 23, 2025** for the following public work:

1-4. SCHEDULE OF BID PRICES, DOCUMENT 00 4113 – BID FORM

ITEM	DESCRIPTION	PRICE (\$)
1	All work of the Contract Documents other than work separately provided for under other bid items, i.e. excluding Bid Alternates item 1.	
	Total Bid Price: (Bid Item 1 through 1)	

Bid Alternates

ITEM	DESCRIPTION	PRICE (\$)
1	Bid Alternate 1: Access controls, Intercoms, cabling, and conduit for Visitor Cell 1154, 1155, 1157	

1-5. ARTICLE 1.03, DOCUMENT 01 1100 – SUMMARY OF WORK

1. Bid Alternate 1: Access controls, Intercoms, cabling, and conduit for Visitor Cell 1154, 1155, 1157

1-6. ARTICLE 1.09, DOCUMENT 01 1100 – SUMMARY OF WORK**WORK DAYS AND HOURS**

A. Work Days and hours: Monday-Friday inclusive, 8:00 a.m.-5:00 p.m. local time

QUESTIONS AND RESPONSES:**2-1. Q: Is this a Union required project?**

A: Yes.

2-2. Q: Do you have an Engineer's Estimate?

A: \$600K.

2-3. Q: Are there special qualifications required?

A: Yes. Contractor must be a B license Contractor and they or Subcontractors are required to be certified Avigilon dealers

2-3. Q: What is the anticipated timeline for the work?

A: Following the bid process, the project requires council approval and contracting, a process that generally takes 3 to 4 months. The work is anticipated to take place in April or May.

2-4. Q: Does the PLC controller need to remain operational during construction?

A: No. Berkeley PD staff will use physical keys during construction.

2-5. Q: Do cameras need to remain operation during construction?

A: Yes.

2-6. Q: How will work be sequenced?

A: The City and Berkeley PD will coordinate with the contractor to develop a strategic plan. The sally port doors will be addressed first, and after that, the contractor will be limited to working on only a few cells at a time.

2-7. Q: How many cells does the jail contain, and how many may be worked on concurrently?

A: There are 4 group cells, 13 individual cells, and 2 safety cells. At any given time, contractors may renovate up to 2 group cells, 1 safety cell, and no more than 4 individual cells.

2-8. Q: What hours will work be permitted?

A: Work is permitted between 8 AM to 5 PM. Work may not commence before 8 AM.

2-9. Q: Drawing TN4.01 detail 1 shows a fence cutting the Telecom room 1111 in half and with access control devices. Please provide details on the fence and (specifically) the locking device. Is it to be electrified mechanical or a maglock? Is this to be included in the fence installers SOW or is it part of Div 28?

A: The wire mesh partition and gate is design/build. See sheets A1.20 and A4.12 for information on door hardware and partition. Specification section 10 22 13 describes wire mesh partition.

2-10. Q: Would a request-to-exit device be needed for the Telecom Room 1111 fence gate? If so, what type. We would recommend a push-to-exit button with a cover.

A: See sheet A4.12 for door hardware required for and in room 1111.

2-11. Q: Can you provide details for the new roof walking pads shown in Sheet A2.33?

A: See specification from 2013 roofing project. (plans and specs for roofing and flashing). Refer to ROOF PLAN sheet A2.30 by Angus-Hamer Networking in APPENDICES and SHEET METAL FLASHING Spec detail SECTION 07620 in APPENDICES.

2-12. Q: Can you provide details of new roofing seams into PVC membrane shown in Sheet A2.33?

A: See specification for 2013 roofing project, seaming into the existing roofing system should be a standard exercise for most roofing contractors. Refer to ROOF PLAN sheet A2.30 by Angus-Hamer Networking in APPENDICES.

2-13. Q: Can you provide a window schedule and interior elevation plan to confirm dimensions for the existing windows to receive window film as indicated in Sheet A4.12?

A: Assume (4) windows at 10 square feet each, approximate dimension = 30-inches by 4-feet.

2-14. Q: Can you provide a door schedule and interior elevation to confirm dimensions for the new wire mesh partition as indicated in Sheet A4.12?

A: The wire mesh partition is a design-build exercise and identified in spec section 10 22 13. The dimension for the partition including the 42-inch wide door is approximately 8-feet wide by 9-feet tall. Hardware groups are on A4.12.

2-15. Q: In sheet A4.12, there's a "EXACT PARTITION LOCATION TO BE DETERMINED IN THE FIELD", please clarify what will be the scope of work to be done for the partition.

A: The wire mesh partition is a design-build exercise and identified in spec section 10 22 13. The dimension for the partition including the 42-inch wide door is approximately 8-feet wide by 9-feet tall. Hardware groups are on A4.12.

2-16. Q: Can you provide existing RCP to confirm type and specs of ceiling for the repair/patching of ceiling?

A: Existing RCP is added to APPENDICES, refer to FIRST FLOOR REFLECTED CEILING PLAN sheet A4.02 by S. J. AMOROSO.

THIS END OF DOCUMENT

ADDENDUM NO. 2

The bid documents for Specification No. 25-11684-C for the Corp Yard City Fleet EV Charger Project are amended as follows:

1-1. COVER PAGE

BID OPENING DATE: Thursday, January 8, 2026

1-2. ARTICLE 1, DOCUMENT 00 1113 – NOTICE INVITING BIDS

Notice Inviting Bids: City of Berkeley ("City") will receive sealed Bids at City of Berkeley, Purchasing Manager's Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until 2:00 PM, **Thursday, January 8, 2026** for the following public work:

1-3. REVISIONS TO SPECIFICATIONS & DRAWINGS

Refer to "SPECIFICATIONS & DRAWING NARRATIVE".

QUESTIONS AND RESPONSES:**2-1 Q: Please confirm and list all of Owner Furnished devices or equipment.**

A: No equipment or devices will be Owner furnished. With the exception of the Windows Active Directory, as called out on spec section 28 13 00, 1.2.B, this is mainly a CFCI project.

2-2. Q: Please confirm in Sheet TY2.01 that indicated IC, EL, and DS on plans are all existing.

A: Refer to symbol schedule TY0.02. It clearly states that IC is new and that EL and DS cabling and hardware exists.

2-3. Q: Please provide details for R2 Swing Gate Wall Rack as indicated in Sheet TY4.01

A: The R2 rack is specified on 27 11 16, 2.2.B. Refer to manufacturer's recommended mounting installation.

2-4. Q: Please provide mounting details for card readers.

A: The card reader is specified on 27 11 16, 2.3.A. Refer to manufacturer's recommended mounting installation.

2-5. Q: 28 13 00_2.5_a_14_a_1) model ix-10as "per manufacture this item has been discontinued. Manufactures comments via email; "the IX-10AS is discontinued so the LE-SS/A & LE-SSR don't really make sense at this point. "

A: Replace the Aiphone Model IX-10AS with the IPW-10VR. Replace the Model LE-SS/A & LE-SSR with model IX-SS-2G. In addition, provide the analog to IP transmitter IPW-1VT.

2-6. Q: TY7.01 & TY7.02 "keynotes TN" while the PoE switches are reflected in Div. 28 specifications (28 23 00_2.5_3), there is no annotation on if Div. 27 or Div. 28 shall provide. It is clear on TY4.01 that Div. 27 (TN2) shall provide workstation furniture while it is reflected in the Div. 28 specifications (28 13 00_2.6_a_4).

A: This is an electronic security project which is why the furniture was specified on section 28 13 00, 2.6 and that the PoE switch was specified on section 28 23 00, 2.5. It is up to the General Contractor on which sub will provide the switch and furniture.

2-7. Q: What scope is included under Bid Alternate 1? Controls Scope? Camera scope? Or Both?

A: Bid Alternate 1 just includes the Access controls, Intercoms, cabling, and conduit for Visitor Cell 1154, 1155, 1157 as detailed in Sheet TN2.01. Camera scope is part of the base bid.

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ADDENDUM NO. 3

The bid documents for Specification No. 25-11684-C for the Public Safety Building Jail Automation Upgrades Project are amended as follows:

1-1. COVER PAGE

BID OPENING DATE: Thursday, February 12, 2026

1-2. ARTICLE 1, DOCUMENT 00 1113 – NOTICE INVITING BIDS

Notice Inviting Bids: City of Berkeley (“City”) will receive sealed Bids at City of Berkeley, Purchasing Manager’s Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until 2:00 PM, **Thursday, February 12, 2026** for the following public work:

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ADDENDUM NO. 4

The bid documents for Specification No. 25-11684-C for the Public Safety Building Jail Automation Upgrades Project are amended as follows:

1-1. COVER PAGE

BID OPENING DATE: Thursday, January 19, 2026

1-2. TABLE OF CONTENTS

Removed Section:

28 13 00 Access Control and Alarm System

Added Sections:

28 15 00 Intercom System

28 46 13 Integrated Sequences of Operation

28 46 19 PLC Integrated Control System

1-3. ARTICLE 1, DOCUMENT 00 1113 – NOTICE INVITING BIDS

Notice Inviting Bids: City of Berkeley ("City") will receive sealed Bids at City of Berkeley, Purchasing Manager's Office, located at the Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704, Telephone (510) 981-7320, until 2:00 PM, **Thursday, January 19, 2026** for the following public work:

1-4. REVISIONS TO SPECIFICATIONS & DRAWINGS

Refer to "ADDENDUM 4 - SPECIFICATIONS & DRAWING NARRATIVE".

QUESTIONS AND RESPONSES:

2-1 Q: Since the primary scope of this project is automation, would we qualify if we subcontract the construction work to a contractor who holds a B license, or is the prime bidder required to hold the General Building Contractor license?

A: A general contractor holding a B license must submit the bid for the project, with any additional trades performed through subcontractors.

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 1100

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes Summary of Work and Work Restrictions including:

1. Work Covered By Contract Documents
2. Bid Item, Allowances and Alternates
3. Contract Document Organization
4. Maintenance
5. Work Under Other Contracts
6. Future Work
7. Work Sequence
8. Work Days and Hours
9. Shutdown for Discovery of Cultural Resources
10. Cooperation of Contractor and Coordination with Other Work
11. Partial Occupancy/Utilization Requirements
12. Contractor Use of Site
13. Air Quality Standards
14. Construction Staking, Monument Protection and Replacement
15. Geotechnical Data and Existing Conditions
16. Protection of Existing Structures and Underground Facilities
17. Permits
18. Actual Damages for Permit Violations
19. Reference Standards
20. Products Ordered in Advance
21. City-Furnished Products

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work comprises of the construction of City's **Public Safety Building Jail Automation Upgrades** located at **2100 Martin Luther King Jr Way**. The Work includes, without limitation, **Upgrades to the low-voltage systems in the first-floor detention area, including modifications to cell and entry door controls, replacement of audio and video surveillance equipment, installation of HVAC systems, and conversion of a storage room into a climate-controlled telecommunications room**, including ancillary work. Contract Documents fully describe the Work.
- B. The Work of this Contract comprises construction of all the Work indicated, described in the Specifications, or otherwise required by the Contract Documents. Unless provided otherwise in the Contract Documents, all risk of loss to Work covered by Contract Documents shall rest with Contractor until Final Acceptance of the Work. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices Bid and no direct or additional payment will be made therefore.
- C. For all Bid items, furnish and install all Work, including connections to existing systems, indicated and described in Specifications and all other Contract Documents. Work and requirements applicable to each individual Bid item, or unit of Work, shall be deemed incorporated into the description of each Bid item (whether Lump Sum or Unit Price). Any Bid item may be deleted from the Work and Contract Sum, in total or in part, prior to or after award of Contract without compensation in any form or adjustment of other Bid items or prices therefore.

- D. Allowance Work shall be done as Change Orders and as specified in Section 01 2600 (Modification Procedures). Identify Allowance Items (See Document 00 4113 [Bid Form]) work on the Progress Schedules and on Applications for Payment. The Amount given on Document 00 4113 (Bid Form) under each Allowance Item is the sum of money set aside for each Allowance Item. These amounts shall be included in the Contract Sum on the Bid Form. If the cost of Work done under any Allowance Item is less than the amount given on the Bid Form under that Allowance Item, the Contract Sum shall be reduced by the difference between the amount given in the Bid Form and the cost of Work actually done.

1.03 BID ITEMS, ALLOWANCES AND ALTERNATES

- A. Descriptions of Lump Sum Items (listed by Bid item numbers):

All labor, materials, services, and equipment necessary for the completion of all of the work in accordance to the Contract Documents

- B. Descriptions of Unit Price Items and Basis of Measurement for Payment (listed by Bid item numbers):

N/A

- C. Allowances: **N/A**

- D. Bid Alternates:

1. Bid Alternate 1: Access controls, intercoms, cabling, and conduit for Visitor Cell 1154, 1155, 1157

1.04 CONTRACT DOCUMENT ORGANIZATION

- A. The Drawings illustrate locations, arrangements, dimensions, and details to determine the general character of the Work. Parts not detailed shall be subject to the Architect's approval. Where reasonably inferable that a Drawing illustrates only part of a given work on a number of items, the remainder shall be deemed repetitious and so construed. Drawings of greater scale take precedence over Drawings of lesser scale. Do not scale documents.
- B. Drawings indicate general arrangement and location of such items as piping, conduit, apparatus, and equipment. Drawings and Specifications are for guidance of the Contractor and exact locations, distances, and levels will be governed by building site and actual building conditions. The Contractor shall make minor changes, as directed, to arrangements or locations shown in order to meet Structural or Architectural conditions.
- C. Specifications describe performances and qualities required of materials and of methods. Items listed under each Section of the Specifications are not necessarily all inclusive. The Contractor shall be responsible for the complete work.
- D. For convenience, Specifications are separated into topical divisions of work, each of which is further related to topical divisions under which it occurs. Such separation shall not be construed as an attempt by the Architect to establish limits of any agreements between the Contractor and his/her subcontractors.
- E. Portions of these Specifications are of abbreviated, simplified type and may include incomplete sentences.
1. Omissions of words or phrases such as "the Contractor shall", "in conformity with", "shall be", "as noted on the Drawings", "in accordance with the details", "a", "the", "all", "any", and "each" are intentional. Omitted words or phrases shall be supplied by inference.
 2. Terms such as "approved", "or approved equal", "as directed", "as required", "as provided", "acceptable", and "satisfactory" mean by or to the Architect or the City.
 3. Furnish: The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

4. Install: The term install describes operations at the Project Site, including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar ions.
5. Provide: The term provide means to furnish and install, complete and ready for the intended use.

F. Reference Standards

1. For products specified by association or trade standards, comply with requirements of the standard except where more rigid requirements are specified or are required by applicable codes.
2. The date of the standard is that in effect as of bid date except where specific date is specified

1.05 MAINTENANCE

- A. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices bid and no direct or additional payment will be made therefor.

1.06 WORK UNDER OTHER CONTRACTS

- A. None expected

1.07 FUTURE WORK

- A. None expected

1.08 WORK SEQUENCE

- A. Construct Work in stages and at times to accommodate City operation requirements during the construction period; coordinate construction schedule and operations with City.
- B. **Special operational constraints include the following:**
 1. Upon arrival, Contractor's Employees will press the call box button at the Addison Street vehicle gate and identify themselves with communications staff. Once parked near the Sally Port, constructions staff can use one of 3 call boxes to enter the jail itself.
 2. Jailers will inspect Contractor's Employees to maintain control of and account for all equipment and tools in their possession.
 3. Construction will take place while the Jail Facility remains occupied by detainees. All detainees will remain secured in their cells, with no contact occurring between them and Contractor's personnel. At times, Contractor's Employees may need to temporarily pause work in shared areas during detainee movement or booking procedures. These interruptions are expected to be minimal. Jail staff will coordinate booking schedules to limit disruptions to construction activities. Contractor's Employees must follow all instructions from jail staff regarding when to pause or cease work within the operational facility
 4. Weapons or knives are prohibited inside the jail facility. Contractor's Employees may be subjected to a search to verify prohibited items have been removed prior to entry. Prohibited items can be left in a vehicle or outside in day lockers.

1.09 WORK DAYS AND HOURS

- A. Work Days and hours: Monday-Friday inclusive, **8:00 a.m.-5:00 p.m.** local time.
- B. Work at the Site on weekends or holidays is not permitted, unless Contractor requests otherwise from City in writing at least 48 hours in advance and City approves in its sole discretion.

1.10 SHUTDOWN FOR DISCOVERY OF CULTURAL RESOURCES

- A. If discovery is made of items of historical archaeological or paleontological interest, immediately cease all Work in the area of discovery. Archaeological indicators may include, but are not limited to, dwelling sites, locally darkened soils, stone implements or other artifacts, fragments of

glass or ceramics, animal bones, human bones, and fossils. After cessation of excavation, immediately contact City. Do not resume Work until authorization is received from City. When resumed, excavation or other activities shall be as directed by City.

1.11 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK

- A. Coordinate with City and any City forces, or other contractors and forces, as required by Document 00 7200 (General Conditions).
- B. Employ a full-time coordinator to constantly review Contract Documents, submittals, changes, and prepare overlay drawings as necessary to avoid conflicts, errors, omissions and untimely construction.

1.12 PARTIAL OCCUPANCY/UTILIZATION REQUIREMENTS

- A. Allow City to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.
- B. Possession, use of Work, and placement and installation of equipment by City shall not in any way evidence the completion of the Work or any part of it.
- C. Contractor shall not be held responsible for damage to the occupied part of the Work resulting from City occupancy.
- D. Make available, in areas occupied, on a 24 hour per day and 7 day per week basis if required, any utility services, heating, and cooling in condition to be put in operation at the time of occupancy.
 - 1. Responsibility for operation and maintenance of said equipment shall remain with Contractor.
 - 2. Make, and City shall certify, an itemized list of each piece of equipment so operated with the date operation commences.
 - 3. Itemized list noted above shall be basis for commencement of warranty period for equipment.
 - 4. City shall pay for utility cost arising out of occupancy by City during construction.
- E. Use and occupancy by City prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by City.
- F. Prior to date of Final Acceptance of the Work by City, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to Defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Document 00 7200 (General Conditions).
- G. Use by City of Work or part thereof as contemplated by this Section 01 1100 shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by City of any of the conditions thereof.
- H. City may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on dates described in this Section 01 1100, if any, prior to Substantial Completion of all of the Work. Notify City in writing when Contractor considers any such part of the Work ready for its intended use and Substantially Complete and request City to issue a Certificate of Substantial Completion for that part of the Work.

1.13 CONTRACTOR USE OF SITE

- A. Access is available to the Site from **Allston Way** or **Addison St.** The entrance to the access road is protected with a gate and lock. Contractor shall ensure that the entrance is locked at the end of each work day and at other times as may be necessary to control unauthorized entry.
- B. Contractor shall contact City at least 2 Business Days prior to entering the building and

performing Work to allow City to arrange access into the building. Access Request forms shall be submitted 48 hours in advance of anticipated on-site Work to gain permission to enter Site and to allow notification to occupants.

- C. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws. Do not unreasonably encumber Site with materials or equipment.
- D. Assume full responsibility for protection and safekeeping of products stored on premises. Move any stored products that interfere with operations of City or other contractor.
- E. Coordinate parking, storage, staging, and Work areas with City. City will review and approve the proposed storage area for Contractor's equipment and materials. Do not store construction materials in the dripline of any tree.
- F. Prior to commencement of Work or excavation, Contractor and City shall jointly survey the area adjacent to the Project area making permanent note and record of such existing damage such as cracks, sags or other similar damage. This record shall serve as a basis for determination of subsequent damage to structures, conditions or other existing improvements due to Contractor's operations. All parties making the survey shall sign the official record of existing damage. Cracks, sags or damage of any nature to the adjacent Project area, not noted in the original survey but subsequently noted, shall be reported immediately to City.
- G. The Contractor shall follow all city ordinances in force during the duration of this Contract.
- H. It is essential that the Contractor perform the Work with as little interference and disturbance as possible to the surrounding neighborhood.
- I. When suspect materials, outside the scope of Work, are encountered during the Work or restoration process, the Contractor shall immediately contact the Project Manager for evaluation and approval of the methods for dealing with the material.

1.14 AIR QUALITY STANDARDS

- A. Ensure that idling time for all heavy equipment is minimized to reduce on-Site emissions.
- B. Maintain equipment in good mechanical condition.
- C. Cover trucks hauling dirt.
- D. Limit dust emissions during periods of high winds (greater than 15 miles per hour).
- E. Replace ground cover in disturbed areas as soon as possible.
- F. Enclose, cover, water, or apply soil binders to exposed stockpiles.
- G. Remove earth tracked onto neighboring paved roads at least once daily.
- H. Limit equipment speed to 10 miles per hour in unpaved areas.

1.15 GEOTECHNICAL DATA AND EXISTING CONDITIONS

- A. Available Documentation: In accordance with, and subject to, the provisions of Document 00 3132 (Geotechnical Data and Existing Conditions), the following documentation is available for review. This information is not part of the Contract Documents.

- 1. **N/A**

1.16 PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND FACILITIES

- A. The Drawings may indicate existing above- and below-grade structures, drainage lines, storm drains, sewers, water lines, gas lines, electrical lines, hot water lines, and other similar items and Underground Facilities that are known to City. At least (2) two Business Days, or as otherwise noted, prior to commencement of excavation, notify the owners of the following Underground Facilities:
 - 1. **Water lines:** EBMUD

2. **Sewer lines:** Berkeley Public Works Department
 3. **Telephone Conduit:** Telephone Provider
 4. **Cable:** Cable Provider
 5. **Electrical Lines:** PG&E
- B. Where overhead service to a structure, known to receive service, does not exist, then underground service shall be assumed to exist.
- C. Attention is also directed to the existence of overhead power and telephone lines.
- D. Perform pot-holing by hand within 24 inches (in any direction) of the Underground Facilities. This may be done on an area-by-area basis, but shall be accomplished at least 7 calendar days in advance of the date of construction within such area.
- E. Telemetry antennas: Ensure that the telemetry and voice communication antennas located on the property remain operational. City's telemetry system is critical to the function and operation of Owner's water supply and distribution system. Coordinate relocation of equipment related to the telemetry and voice communication systems with Owner. Notify Owner 3 calendar days prior to conducting any Work in the vicinity of the telemetry antenna.
- F. No attempt has been made to locate utilities on private property such as sprinkler irrigation systems or electrical conduits on the project site or adjacent property. Contractor is responsible for contacting all property owners as necessary, and locating and marking utilities in the vicinity of the work prior to construction.
- G. In addition to reporting, if a utility is damaged, Contractor must take appropriate action as provided in Document 00 7200 (General Conditions).
- H. Additional compensation or extension of time on account of utilities not indicated or otherwise brought to Contractor's attention including reasonable action taken to protect or repair damage shall be determined as provided in Document 00 7200 (General Conditions).

1.17 PERMITS

- A. Permits, agreements, or written authorizations that are known by City to apply to this Project are listed below:
1. Storm Water Pollution Prevention
 2. Cal/OSHA Permit. Obtain, as applicable, permit(s) as required by Cal/OSHA for the following:
 - a. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.
 - b. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).
 - c. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).
 3. The local Cal/OSHA district office is located at:

CAL/OSHA Headquarters
1515 Clay Street, Suite 1303
Oakland, CA 94612
(510) 622-2916
- B. All other permits that may be required, such as electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, etc., have not been applied for and shall be obtained by Contractor. Applicable permit fees will be reimbursed to the extent specified in Document 00 7200 (General Conditions).

1.18 ACTUAL DAMAGES FOR PERMIT VIOLATIONS

- A. In addition to damages which are impracticable or extremely difficult to determine, for which liquidated damages will be assessed as described in Document 00 5200 (Agreement) and Document 00 7200 (General Conditions), City may incur actual damages, including fines imposed by any regulatory agency, resulting from use in violation of legal or regulatory requirements where the violations result from Contractor's activities. Continuous operation in compliance with legal or regulatory requirements is essential to avoid discharges that would violate applicable regulations. Violations or threatened violations may subject City to fines or occurrence and/or other costs or civil liabilities.
- B. Contractor shall be liable for and shall pay City the amount of any actual losses in addition to liquidated damages or other remedies provided by the Contract Documents.
- C. The amount of liquidated damages provided in Document 00 5200 (Agreement) and Document 00 7200 (General Conditions) is not intended to include, nor does the amount include, any damages incurred by City for reasons other than those listed in that paragraph. Any money due or to become due to Contractor may be retained by City to cover both the liquidated and the actual damages described above and, should such money not be sufficient to cover such damages, City shall have the right to recover the balance from Contractor or its sureties.

PART 2 - PRODUCTS**2.01 REFERENCE STANDARDS**

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

2.02 PRODUCTS ORDERED IN ADVANCE

- A. As provided in Document 00 7200 (General Conditions) and Section 01 2000 (Measurement and Payment), and subject to all other provisions of the Contract Documents, City will pay for the following materials and equipment prior to incorporation into the Work:

- 1. **None**

2.03 CITY-FURNISHED PRODUCTS

- A. City-Furnished Products:

- 1. **None**

- B. City's Responsibilities:

- 1. Arrange for and deliver City-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
 - 2. Arrange and pay for delivery to Site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, Defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.

- C. Contractor's Responsibilities:

- 1. Review City-reviewed Shop Drawings, Product Data, and Samples.
 - 2. Receive and unload products at Site; inspect for completeness or damage jointly with City.
 - 3. Handle, store, install, and finish products.
 - 4. Repair or replace items damaged after receipt.
 - 5. Install into Project per Contract Documents.

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2000

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes description of requirements and procedures for determining amount of Work performed and for obtaining payment for Work performed.

1.02 REFERENCES

- A. California Public Contract Code
- B. Code of Civil Procedures
- C. Government Code

1.03 COMPOSITION AND SCOPE OF CONTRACT SUM

A. Scope of Contract Sum

- 1. The Contract Sum for performance of the Work under Contract Documents, or under any Bid item, allowance, or Alternate, shall include full compensation for all Work required under the Contract Documents, including without limitation, all labor, materials, taxes, transport, handling, storage, supervision, administration, and all other items necessary for the satisfactory completion of the Work, whether or not expressly specified or indicated, incidental work and unexpected expenses, and all terms, conditions, requirements and limitations set forth in the Contract Documents.
- 2. Contract Sum may be expressed as lump sum, unit price, GMP, allowance, or combination thereof.

B. Unit Price items

- 1. Quantity of Work to be paid for under any item for which a unit price is fixed in Contract Documents shall be determined by City based on, so far as practicable, actual number of units satisfactorily completed, as determined by City and certified by Contractor, within prescribed or ordered limits, and no payment will be made for Work unsatisfactorily performed or done outside of limits.
- 2. Unit Prices shall apply to Work covered by unit prices so long as actual quantities performed on the Project are not less than 75 percent or greater than 125 percent of the estimated quantities bid or otherwise stated in the Contract Documents. If actual quantities exceed these parameters, then the unit price shall be adjusted by an amount to reflect the Contractor's incremental cost differential resulting from increased or decreased economies of scale.

C. Lump Sum Items

- 1. When estimated quantity for specific portion of Work is not indicated and/or Work is designated as lump sum, payment will be on a lump sum basis for Work satisfactorily completed in accordance with Contract Documents.
- 2. Payment for lump sum Work, or items of Work subject to a lump sum (e.g. without limitation, change order work), shall be made on the basis of satisfactory completion of such Work or work item, earned in progressive stages in accordance with the Contract Documents, up to but not exceeding the Contractor's percentage completion of the Work or item.
- 3. Lump sum items shall be paid based upon the approved Schedule of Values, which shall be

used to measure progressive payments based upon satisfactory progress towards completion of the item.

D. Allowance Items

1. Allowances: Allowance Work will be authorized by City in writing, following change order procedures to determine cost, supporting documentation and authorization to proceed. Unused allowance amounts at Contract completion shall reduce the Contract price accordingly.

1.04 PAYMENT PROCEDURES

A. Schedule of Values:

1. Within ten calendar days from issuance of Notice of Award and prior to the Contractor's first Application for Payment, Contractor shall submit a detailed breakdown of its Bid by scheduled Work items and/or activities, including coordination responsibilities and Project Record Documents responsibilities. Where more than one Subcontractor comprises the work of a Work item or activity, the Schedule of Values shall show a separate line item for each subcontract. Contractor shall furnish such breakdown of the total Contract Sum by assigning dollar values (cost estimates) to each applicable Progress Schedule network activity, which cumulative sum equals the total Contract Sum. This breakdown shall be referred to as the Schedule of Values.
2. Contractor's overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Bid item) and/or other financing, as well as "general conditions costs," (e.g., Site cleanup and maintenance, temporary roads and access, off-Site access roads, temporary power and lighting, security, and the like), shall be prorated through all activities so that the sum of all the Schedule of Values line items equals Contractor's total Contract Sum, less any allowances designated by City. Scheduling, record documents and quality assurance control shall be separate line items.
3. City will review the breakdown in conjunction with the Progress Schedule to ensure that the dollar amounts of this Schedule of Values are, in fact, reasonable cost allocations for the Work items listed. Upon favorable review by City, City will accept this Schedule of Values for use. City shall be the sole judge of fair market cost allocations.
4. City will reject any attempt to increase the cost of early activities, i.e., "front loading," resulting in a complete reallocation of moneys until such "front loading" is corrected. Repeated attempts at "front loading" may result in suspension or termination of the Work for default, or refusal to process progress payments until such time as the Schedule of Values is acceptable to City.

B. Contractor's Requests for Progress Payments

1. If requested by Contractor, progress payments will be made monthly, under the following conditions:
2. On or before the 25th Day of each month, Contractor shall submit to City five copies of an Application for Payment for the cost of the Work put in place during the period from the last Day of the previous month to the end of the current month, along with one copy of an updated Progress Schedule. Such Applications for Payment shall be for the expected total value of activities completed or partially completed, based upon Schedule of Values prices (or Bid item prices if unit price) of all labor and materials incorporated in the Work up until midnight of the last Day of that one month period, less the aggregate of previous payments. Accumulated retainage shall be shown as separate item in payment summary. City and Contractor will reconcile any differences in the field, based on the reconciled monthly report sheets. If Contractor is late submitting its Application for Payment, that Application may be processed at any time during the succeeding one-month period, resulting in processing of Contractor's Application for Payment being delayed for more than a Day for Day basis.
3. Except as otherwise provided in a labor compliance program applicable to the Work (if any) or as otherwise required by City, concurrently with each Application for Payment, Contractor shall submit to the City the Contractor's and its Subcontractors' certified payroll records required to be maintained pursuant to Labor Code Section 1776 for all labor performed during pay periods

ending during the period covered by the Application for Payment.

4. No progress payment will be processed prior to City receiving all requested, acceptable schedule update information and certified payrolls, and in City's sole and absolute discretion, City may deny the entire Application for Payment for noncompliance.
5. Each Application for Payment shall list each Change Order and Construction Change Directive ("CCD") executed prior to date of submission, including the Change Order/CCD Number, and a description of the Work activities, consistent with the descriptions of original Work activities. Contractor shall submit a monthly Change Order/CCD status log to City.
6. If City requires substantiating data, Contractor shall submit information requested by City, with cover letter identifying Project, Application for Payment number and date, and detailed list of enclosures. Contractor shall submit one copy of substantiating data and cover letter for each copy of Application for Payment submitted.
7. If Contractor fails or refuses to participate in monthly Work reconciliations or other construction progress evaluation with City, Contractor shall not receive current payment until Contractor has participated fully in providing construction progress information and schedule update information to City.

C. City's Review of Progress Payment Applications

1. City will review Contractor's Application for Payment following receipt and during the Progress Schedule and Billing Meeting. If adjustments need to be made to percent of completion of each activity, City will make appropriate notations and return to Contractor. Contractor shall revise and resubmit. All parties shall update percentage of completion values in the same manner, i.e., express value of an accumulated percentage of completion to date.
2. If City determines that portions of the Application for Payment are not proper or not due under the Contract Documents, then City may approve the other portions of the Application for Payment, and in the case of disputed items or Defective Work not remedied, may withhold up to 150 percent of the disputed amount from the progress payment.
3. Pursuant to California Public Contract Code §20104.50, if City fails to make any progress payment within 30 calendar days after receipt of an undisputed and properly submitted Application for Payment from Contractor, City shall pay interest to the Contractor equivalent to the legal rates set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure. The 30-Day period shall be reduced by the number of calendar days by which City exceeds the seven-Day return requirement set forth herein.
4. As soon as practicable after approval of each Application for Payment for progress payments, City will pay to Contractor in manner provided by law, an amount equal to 95 percent of the amounts otherwise due as provided in the Contract Documents, or a lesser amount if so provided in Contract Documents and by law, provided that payments may at any time be withheld if, in judgment of City, Work is not proceeding in accordance with Contract, or Contractor is not complying with requirements of Contract, or to comply with stop notices or to offset liquidated damages accruing or expected. In City's sole discretion, if Contractor has failed to comply with either its Progress Schedule update or project record documents requirements, City may retain an additional 5% of any earned amounts until such requirements are satisfied.
5. Before any progress payment or final payment is due or made, Contractor shall submit satisfactory evidence that Contractor is not delinquent in payments to employees, Subcontractors, suppliers, or creditors for labor and materials incorporated into Work. This specifically includes, without limitation, conditional lien release forms for the current progress payment and unconditional release forms for past progress payments. This also includes copies of certified payroll from contractor and subcontractors for the current payment period.

D. Payment for Material and Equipment Not Yet Incorporated Into the Work

1. No payment shall be made for materials or equipment not yet incorporated into the Work,

except as specified elsewhere in the Contract Documents or as may be agreed to by City in its sole discretion. Where Contractor requests payment on the basis of materials and equipment not incorporated in the Work, Contractor must satisfy the following conditions:

2. The materials and/or equipment shall be delivered and suitably stored at the Site or at another local location agreed to in writing, for example, a mutually acceptable bonded and insured warehouse.
3. Full title to the materials and/or equipment shall vest in City at the time of delivery to the Site, warehouse or other storage location. Obtain a negotiable warehouse receipt, endorsed over to City for materials and/or equipment stored in an off-site warehouse. No payment will be made until such endorsed receipts are delivered to City.
4. Stockpiled materials and/or equipment shall be available for City inspection, but City shall have no obligation to inspect them and its inspection or failure to inspect shall not relieve Contractor of any obligations under the Contract Documents. Materials and/or equipment shall be segregated and labeled or tagged to identify these specific Contract Documents.
5. After delivery of materials and/or equipment, if any inherent or acquired defects are discovered, defective materials and/or equipment shall be removed and replaced with suitable materials and/or equipment at Contractor's expense.
6. At Contractor's expense, insure the materials and/or equipment against theft, fire, flood, vandalism, and malicious mischief, as well as any other coverages required under the Contract Documents.
7. Contractor's Application for Payment shall be accompanied by a bill of sale, invoice or other documentation warranting that City has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect City interest therein, all of which must be satisfactory to City. This documentation shall include, but not be limited to, conditional releases of mechanics' liens and stop notices from all those providing materials and equipment as to which the Application for Payment relates, as well as unconditional releases of the same from the same as to the previous Application for Payment for which they have not already been provided. Amounts previously paid for materials and equipment prior to incorporation into the Work shall be deducted from amounts otherwise due Contractor as they are incorporated.

1.05 FINAL PAYMENT

A. Final Payment

1. As soon as practicable after all required Work is completed in accordance with Contract Documents, including punchlist, testing, record documents and Contractor maintenance after Final Acceptance, Contractor shall submit its Application for Final Payment.
2. Provided Contractor has met all conditions required for Final payment, City will pay to Contractor, in manner provided by law, unpaid balance of Contract Sum of Work (including, without limitation, retentions), or whole Contract Sum of Work if no progress payment has been made, determined in accordance with terms of Contract Documents, less sums as may be lawfully retained under any provisions of Contract Documents or by law.

B. Final Accounting

1. Prior progress payments and change orders shall be subject to audit and correction in the final payment.
2. Contractor and each assignee under an assignment in effect at time of final payment shall execute and deliver at time of final payment, and as a condition precedent to final payment, Document 00 6530 (Agreement and Release of Claims).

1.06 SUBSTITUTION OF SECURITIES

A. Public Contract Code Section 22300. In accordance with the provisions of Public Contract

Code Section 22300, substitution of securities for any moneys withheld under Contract Documents to ensure performance is permitted under following conditions:

1. At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and City which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such moneys to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.
2. Alternatively, Contractor may request and City shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and receive the interest earned on the investments upon the same terms provided for securities deposited by Contractor. Upon satisfactory completion of the work of the Contract Documents, Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from City. Contractor shall then pay to each Subcontractor, not later than 10 calendar days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of Contractor.
3. Contractor shall be beneficial owner of securities substituted for moneys withheld and shall receive any interest thereon.
4. Contractor may enter into an escrow agreement, form included in Contract Documents, as authorized under Public Contract Code Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract Documents.
5. Public Contract Code Section 22300, in effect on Bid Day, is hereby incorporated in full by this reference and shall supersede anything inconsistent therewith.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 2600

MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements that supplement the paragraphs of Document 00 7200 (General Conditions).
- B. Description of procedures for modifying the Contract Documents and determining costs for changes in contract amounts.

1.02 PROCEDURES FOR CONTRACTOR INITIATED CHANGE ORDER

- A. Contractor-Initiated Change Proposal Request (CPR) and Procedures:
 - 1. Contractor may initiate changes by submitting a Change Proposal Request ("CPR").
 - 2. Whenever Contractor elects or is entitled to submit a CPR, Contractor shall prepare and submit to City for consideration a CPR using the form included in this Project Manual. All CPRs must contain a complete breakdown of costs of credits, deducts and extras; itemizing materials, labor, taxes, Markup and any requested changes to Contract Time. All Subcontractor Work shall be so indicated. Individual entries on the CPR form shall include applicable Schedule of Values code, with all amounts determined as provided herein. After receipt of a CPR with a detailed breakdown, City will act promptly thereon.
 - 3. If City accepts a CPR, City will prepare a Change Order for City and Contractor signatures.
 - 4. If CPR is not acceptable to City because it does not agree with Contractor's proposed cost and/or time, City will provide comments thereto. Contractor will then, within seven (7) calendar days (except as otherwise provided herein), submit a revised CPR.
 - 5. When necessity to proceed with a change does not allow City sufficient time to conduct a proper check of a CPR (or revised CPR), City may issue a Change Directive (CD) as provided below.
- B. Contractor-Initiated Request for Information (RFI) Procedures, Requirements and Limitations:
 - 1. Contractor may submit RFI's for clarifications in City-prepared Contract Documents, which may result in the Contractor submitting a CPR.
 - 2. Whenever Contractor requires information regarding the Project or City-prepared Contract Documents, or receives a request for such information from a Subcontractor, Contractor may prepare and deliver an RFI to City. Contractor shall use RFI format provided on approval by City. Contractor shall not issue an RFI to City solely to clarify Contractor-prepared Construction Documents. Contractor must submit time critical RFIs at least 30 calendar days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.
 - 3. Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation for the effort required to submit the RFIs. Contractor shall be

responsible for City's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by City; at City discretion, such costs may be deducted from progress payments or final payment.

4. City will respond within ten (10) calendar days from receipt of RFI with a written response to Contractor. Contractor shall distribute response to all appropriate Subcontractors.
5. If Contractor is satisfied with the response and does not request a change in Contract Sum or Contract Time, then the response shall be executed without a change.
6. If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating it is a follow-up RFI) to City clarifying original RFI. Additionally, City may return RFI requesting additional information should original RFI be inadequate in describing condition.

C. Time Requirements:

1. If Contractor believes that a City response to an RFI, submittal or other City direction, results in change in Contract Sum or Contract Time, Contractor shall notify City with the issuance of a preliminary CPR within ten calendar days after receiving City's response or direction, and in no event after starting the disputed work or later than the time allowed under Article 12 of Document 00 7200 (General Conditions). If Contractor also requests a time extension, or has issued a notice of delay or otherwise requests a time extension with a CPR, then Contractor shall submit a Time Impact Evaluation (TIE) required herein concurrently with the CPR and in no event later than ten calendar days after providing the notice of delay.
2. If Contractor requires more time to accurately identify the required changes to the Contract Sum or Contract Time, Contractor may submit an updated and final CPR and TIE within 14 calendar days of submitting the preliminary CPR.
3. If City agrees with Contractor's CPR and/or TIE, then City will prepare a Change Order for City and Contractor signatures. If City disagrees with Contractor, then Contractor may give notice of potential claim as provided in Article 12 of Document 00 7200 (General Conditions), and proceed thereunder.
4. Contractor must submit CPRs, notices of potential claim or Claims within the required time periods. Any failure to do so waives Contractor's right to submit a CPR or file a Claim.

D. Cost Estimate Information:

1. Contractor and subcontractors shall, upon City's request, permit inspection of the original unaltered cost estimates, subcontract agreements, purchase orders relating to the change, and documents substantiating all costs associated with its CPR or Claims arising from changes in the Work.

1.03 PROCEDURES FOR CITY INITIATED CHANGE ORDERS

A. City Initiated Change Directives (CD):

1. City may, by Change Directive ("CD") or initially by Instruction Bulletin or by following the procedures for disputed work herein, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, with or without adjustment to Contract Sum or Contract Time.
2. If at any time City believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, or at any other time, City may issue a CD with its recommended cost and/or time adjustment (if any). Upon receipt of CD, Contractor shall promptly proceed with the change of Work involved and respond to City within ten (10) calendar days.
3. Contractor's response must be any one of following:
 - a. Return CD signed, thereby accepting City response, including adjustment to time and cost (if any).

- b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by letter A, B, etc. for each revision), if City so requests.
 - c. Give notice of intent to submit a claim as described in Article 12 of Document 00 7200 (General Conditions), and submit its claim as provided therein.
 4. If CPR or the CD provides for an adjustment to any Contract Sum, the adjustment shall be based on one of the following methods:
 - a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
 - b. Contractor to proceed on cost reimbursable (force account) basis while negotiating towards a firm price.
 - c. Cost to be determined in a manner agreed.
 5. Change Directive signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum or the method for determining them. Such agreement shall be effective immediately and shall be finalized as a Change Order. Where City authorizes CD work on a time and materials basis up to a maximum amount, then Contractor shall promptly advise City upon reaching 75% of such maximum amount, otherwise Contractor shall accept fully the risk of completing the CD work without exceeding such maximum amount.
 6. If Contractor does not respond promptly or disagrees with the method for adjustment (or non-adjustment) in the Contract Sum, the method and the adjustment shall be determined by City on the basis of the Contract Documents and the reasonable expenditures and savings of those performing the Work attributable to the change. If the parties still do not agree on the proper adjustment due to a Change Directive, Contractor may file a Claim per Article 12 of Document 00 7200 (General Conditions) and/or City may direct the changed work through a unilateral change order. Contractor shall keep and present an itemized accounting in a manner consistent with the SOV, together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided herein.
 7. Pending final determination of cost to City, Contractor may include amounts not in dispute in its Applications for Payment. The amount of credit to be allowed by Contractor to City for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by City. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for Markup shall be figured on the basis of net increase, if any, with respect to that change.
- B. City Initiated Change Order (CO) or Request for Proposal (RFP):
 1. City may initiate changes in the Work or Contract Time by issuing a Request for Proposal ("RFP") or Change Order ("CO") to Contractor.
 2. City may issue an RFP to Contractor. Any RFP will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.
 3. In response to an RFP, Contractor shall furnish a Change Proposal Request (CPR) within twenty-one (21) Business Days of City's RFP. Upon approval of CPR, City may issue a Change Directive directing Contractor to proceed with extra Work.
 4. If the parties agree on price and time for the work, the City will issue a Contact Change Order. If the parties do not agree on the price or time for a CPR, City may either issue a CD or decide the issue per Article 12 of Document 00 7200 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

1.04 PROCEDURES THAT APPLY TO CONTRACTOR- AND CITY-INITIATED CHANGE ORDERS

- A. Adjustment of Schedules to Reflect Change Orders or CDs:
 1. Contractor shall revise Schedule of Values and Application for Payment forms to record each

authorized Change Order or CD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.

2. Contractor shall revise the Progress Schedules prior to the next monthly pay period, to reflect CO or CD.
3. Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.

B. Required Documentation for Adjustments to Contract Amounts:

1. For all changes and cost adjustments requested, Contractor shall provide documentation of change in Contract Amounts asserted, with sufficient data to allow evaluation of the proposal.
2. In all requests for compensation, cost proposals, estimates, claims and any other calculation of costs made under the Contract Documents, Contractor shall breakout and quantify costs of labor, equipment and materials identified herein, for Contractor and subcontractors of any tier.
3. Contractor shall, on request, provide additional data to support computations for:
 - a. Quantities of products, materials, labor and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
 - d. Credit for deletions from Contract, similarly documented.
4. Contractor shall support each claim or computation for additional cost, with additional information including:
 - a. Origin and date of claim or request for additional compensation.
 - b. Dates and times Work was performed and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.
 - e. Credit for deletions from Contract, similarly documented.

C. Responses and Disputes:

1. For all responses for which the Contract Documents do not provide a specific time period, recipients shall respond within a reasonable time.
2. For all disputes arising from the procedures herein, Contractor shall follow Article 12 of Document 00 7200 (General Conditions).

1.05 COST DETERMINATION FOR CHANGES IN CONTRACT AMOUNTS

A. Calculation of Total Cost of Extra Work:

1. Total cost of changed Work, extra Work or of Work omitted shall be the sum of three components defined immediately below as: Component 1 (Direct Cost(s)); Component 2 (Markup); and, Component 3 (bonds, insurance, taxes)
2. Component 1: Direct Cost(s) of labor, equipment and materials, is calculated based upon actually incurred (or omitted) labor costs, material costs and equipment rental costs, as defined herein;
3. Component 2: Markup on such actually incurred Direct Costs, is applied in the percentages identified below; and
4. Component 3: Actual additional costs for any additionally required insurance, bonds, and/or taxes, defined herein, is calculated without Markup.

1.06 MEASUREMENT OF DIRECT COST OF CONSTRUCTION (COST COMPONENT NO. 1)

A. Composition of Component 1 (Direct Cost of Construction):

1. Component 1 has four subcomponents, also referred to as "LEMS":
 - a. Labor (Component 1A)
 - b. Equipment (Component 1B)
 - c. Materials (Component 1C)
 - d. Subcontractors (Component 1D)
- B. Measurement of Cost of Labor (Component 1A):
 1. Cost of Labor shall be calculated as: Cost of labor for workers (including forepersons when authorized by City) used in actual and direct performance of the subject work, whether employer is Contractor, Subcontractor or other forces, in the sum of the following:
 - a. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
 - b. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined, such as worker's compensation insurance. Such labor surcharge shall not exceed generally accepted standards in the State for labor rates in effect on date upon which extra Work is accomplished.
 - c. Cost of labor shall include no other costs, fees or charges.
 2. Labor cost for operators of equipment owned and operated by Contractor or any Subcontractor, shall be no more than rates of such labor established by collective bargaining agreements for type of worker and location of Work, whether or not owner-operator (i.e., Contractor or Subcontractor) is actually covered by such an agreement.
 3. Cost of labor shall be recorded and documented in certified payroll records, maintained in the form customary and/or required in the State, delivered to City weekly.
- C. Measurement of Cost of Equipment (Component 1B):
 1. Measurement of Component 1B (Cost of Equipment). Cost of Equipment shall be calculated as: Cost of Equipment used in actual and direct performance of the subject work, whether by Contractor, Subcontractor or other forces. Cost of Equipment shall be calculated as herein described.
 2. For rented equipment, cost will be based on actual rental invoices, appropriate for the use and duration of the work. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by City.
 3. Equipment rental cost for Contractor or Subcontractor-owned equipment, shall be determined by reference to, and not in excess of, the generally accepted standards in the State for equipment rental rates in effect on date upon which extra Work is accomplished. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the CalTrans Standard Schedules and Specifications, and absent a rental rate therein, then the Association of Equipment Distributors (AED) book.
 4. In all cases, rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.
 5. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.
 6. For equipment on Site, rental time to be paid for equipment shall be time equipment is in

operation on extra Work being performed or on standby as approved by City. The following shall be used in computing rental time of equipment:

- a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
 - b. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
 - c. Rates shall correspond to actual rates paid by Contractor, i.e., if Contractor pays lower weekly or monthly rates, then same shall be charged to City.
7. For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
- a. City will pay for costs of loading and unloading equipment.
 - b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
 - c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission or appropriate State Dept. of Transportation.
 - d. City will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
 - e. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which City directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and City legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.
8. Employee vehicles are not part of Component 1A, rather, are included within Component 2 (Markup).
9. Equipment costs shall include no other costs, fees or charges.
- D. Measurement of Cost of Material (Component 1C):
1. Cost of Material shall be calculated as herein described. Cost of such materials will be cost to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:
 2. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to City notwithstanding fact that such discount may not have been taken.
 3. For materials salvaged upon completion of Work, salvage value of materials shall be deducted from cost, less discounts, of materials.
 4. If cost of a material is, in opinion of City, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in this Paragraph.
 5. Material costs shall include no other costs, fees or charges.
- E. Measurement of Cost of Subcontractors (Component 1D):
1. Where reimbursed or calculated per the terms of the Contract Documents, change order or Change Directive, cost of Subcontractors shall be calculated as amounts earned by Subcontractors procured in compliance with the Contract Documents and approved by the City, provided such subcontractor earned amounts meet the following requirements:
 - a. Such amounts are earned under the terms of the Subcontracts and the Work complies with the terms of the Contract Documents;

- b. Such amounts are properly requested, documented and permitted under the terms of the subcontract(s) and the Contract Documents.
- c. Total cost to City of Direct Costs of Construction (labor, equipment, materials), Markup, and costs of bonds, insurance and taxes, conform to contract limitations (i.e., totals paid by City do not exceed the 20% Markup limitation.).

1.07 MEASUREMENT AND PAYMENT OF MARK UP (COST COMPONENT 2)

A. Markup Percentages for Changed Work (Component 2):

- 1. Markup on Direct Cost of labor and materials for extra Work shall be 15%. Markup on Direct Cost of equipment for extra Work shall be 15%.
- 2. When extra Work is performed by Subcontractors, regardless of the number of tiers, total Markup on "Component 1" Direct Costs shall not exceed 20%. Contractor and its Subcontractors shall divide the 20% as they may agree.
- 3. Under no circumstances shall the total Markup on any extra Work exceed twenty (20) percent, stated as a percent of the Direct Cost of labor, equipment and materials. This limitation shall apply regardless of the actual number of subcontract tiers.
- 4. On proposals covering both increases and decreases in Contract Sum, Markup shall be allowed on the net increase only as determined above. When the net difference is a deletion, no percentage for Markup shall be allowed, but rather an appropriate percentage deduction shall be issued in the amount of the net difference.

B. Measurement and Payment of Mark Up (Component 2):

- 1. Mark Up (Component 2) provides complete compensation to Contractor for:
 - a. All Contractor profit;
 - b. All Contractor home-office overhead;
 - c. All Contractor assumption of risk assigned to Contractor under the Contract Documents;
 - d. Subject to the qualifications below regarding self-performed work, all General Conditions and General Requirements.
- 2. Profit. Compensation for profit included within Component 2 (Mark Up), includes without limitation: Fees of all types, nature and description; and Profit and margins of all types, nature and description.
- 3. Home Office Expenses. Compensation for home office expenses included within Component 2 (Mark Up), includes without limitation: Salaries and other compensation of any type of Contractor's personnel (management, administrative and clerical), and all direct and indirect operating, travel, payroll, safety, storage, quality control, maintenance and overhead costs of any nature whatsoever, incurred by Contractor at any location other than the Project specific site office, including without limitation, Contractor's principal or branch offices; insurance premiums other than those for Project specific insurance directed by the City in a change order; all hardware, software, supplies and support personnel necessary or convenient for Contractor's capture, documentation and maintenance of its costs and cost accounting data and cost accounting and control systems and work progress reporting.
- 4. Assumption of Risk. Compensation for Contractor's assumption of risk under the Contract Documents, included within Component 2 (Mark Up), includes without limitation loss, cost, damage, expense or liability resulting directly or indirectly from any of the following causes ("unallowable costs"), for Contractor and subcontractors of any tier: noncompliance with the Contract Documents, fault or negligence, defective or non-conforming Work, by Contractor or any Subcontractor or Vendor of any tier or anyone directly or indirectly employed by any of them, or for whose acts or omissions any of them are responsible or liable at law or under the Contract Documents; cost overruns of any type; costs in excess of any lump sum, not to exceed amount or GMP; costs resulting from bid or "buy out" errors, unallocated scope, or incomplete transfer of scope or contract terms to subcontractors; any costs incurred by Contractor relating to a Change in the Work without a Change Order or Change Directive in accordance with the

Contract Documents; costs for work or materials for which no price is fixed in the Contract Documents, unless it is expressly specified that such work or material is to be paid for as extra work.

5. General Conditions and Division 1 General Requirements. Compensation for Contractor's General Conditions and General Requirements Costs included within Component 2 (Mark Up), includes compensation to Contractor for: Contractor's direct costs, without overhead or profit, for salaries and related forms of compensation and employer's costs for labor and personnel costs, of Contractor's employees and subconsultant's employees (if any), while and only to the extent they are performing Work at the Project Site. Personnel and Work compensated by this Component include without limitation: All required Project management responsibilities; all on-site services; monthly reporting and scheduling; routine field inspection of Work; general superintendence; general administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary; salaries of project superintendent, project engineers, project managers, safety manager, other manager, timekeeper, and secretaries; all cost estimates and updates thereto; development, validation and updates to the project schedule; surveying; estimating. Compensation for Contractor's General Requirements Costs included within Component 2 (Mark Up), compensates Contractor for its "General Requirements" Costs, including without limitation: all scheduling hardware, software, licenses, equipment, materials and supplies; purchase, lease or rental, build out, procurement, supporting equipment and maintenance of temporary on-Site facilities, Project field and office trailers and other temporary facilities, office equipment and supporting utilities; platforms, fencing, cleanup and jobsite security; temporary roads, parking areas, temporary security or safety fencing and barricades, etc.; all Contractor's motor vehicles used by any Contractor's personnel, and all costs thereof; all health and safety requirements, required by law or City procedures; all surveying; all protection of Work; handling and disposal fees; final cleanup; repair or maintenance; other incidental Work; all items, activities and function similar to any of those described above; all travel, entertainment, lodging, board and the like.
6. Personnel compensated by the Markup Component do not include workers of foreman level or below in the case of self-performed work; rather, such personnel shall be treated as a Direct Cost of Construction. Costs compensated by the Markup component do not include temporary measures specifically required by the changed work, not otherwise required or ongoing in the prosecution of the Work, that commence specifically to support the changed work and conclude with the completion of the changed work. Such costs shall be treated as Direct Costs of Construction. Examples of General Requirements costs that this component may not cover are the following: temporary barricades or fencing of specific areas required specifically for the changed work; cranes required specifically for the changed work; extra security required specifically for the changed work.

1.08 MEASUREMENT AND PAYMENT OF BONDS INSURANCE TAXES (COMPONENT 3)

- A. Measurement of Bonds, Insurance, Taxes (Component 3):
 1. Component 3 (Bonds, Insurance, Taxes) consists of the cost of bonds, insurance and taxes, also referred to as "**BIT**". All State sales and use taxes, applicable County and applicable City sales taxes, shall be included. Federal and Excise tax shall not be included.
 2. There is no mark up on BIT.

1.09 EFFECT OF PAYMENT

- A. Change Order Compensation is All Inclusive.
 1. Except as provided expressly below regarding changes that extend the Contract Time, payment of calculated cost of extra work constitutes full and complete compensation for costs or expense arising from the extra Work, and is intended to be all inclusive.
 2. Payment for Direct Cost of Construction (Component 1 or LEMS) is intended to be all-inclusive. Any costs or risks not delineated within cost of labor, equipment or materials herein, shall be deemed to be within the costs and risks encompassed by the applicable Markups and

unallowable in any separate amount.

3. Payment of Markup (Component 2) is intended to be all-inclusive. Contractor waives claims for any further or different payment of cost and risk items delineated herein, other than the allowable percentage markup on costs set forth in the Contract Documents; such separate, further or different cost or risk items shall be unallowable, waived and liquidated within the allowable percentage markup.
4. Contractor shall recover no other costs or markups on extra work of any type, nature or description.

B. Exception for Changes Extending the Contract Time.

1. Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct costs, provided Contractor can demonstrate such additional costs are (i.) actually incurred performing the Work, (ii.) not compensated by the Markup allowed, and (iii) directly result from the extended Contract Time. Contractor shall make such request and provide such documentation following all required procedures, documentation and time requirements in the Contract Documents, and subject to all contract limitations of liability. Contractor may not seek or recover such costs using formulas (e.g., Eichleay).

C. Limits of Liability / Accord and Satisfaction.

1. The foregoing limits of compensation apply in all cases of claims for changed Work, whether calculating Change Proposal Requests, Change Orders or CDs, or calculating claims and/or damages of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature.
2. Under no circumstances may Contractor claim or recover special, incidental or consequential damages against City, its representatives or agents, whether arising from breach of contract, negligence, strict liability or other tort or legal theory, unless specifically and expressly authorized in the Contract Documents.
3. No change in Work shall be considered a waiver of any other condition of Contract Documents. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatever, except as expressly provided for in Contract Documents.
4. Accord and Satisfaction: Every Change Order and accepted CD shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CD, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 00 7200 (General Conditions) no later than thirty (30) calendar days after Contractor's first written notice of its intent to reserve rights. Execution of any Change Order or CD shall constitute Contractor's representation of its agreement with this provision.

1.10 MISCELLANEOUS REQUIREMENTS

A. City-Furnished Materials.

1. City reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and Markup on such materials.

B. Records And Certification.

1. All charges shall be recorded daily and summarized in Change Proposal Request form attached hereto. Contractor or authorized representative shall complete and sign form each day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; and a list by size type and identification

number of equipment and hours operated.

2. City shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including CD Work. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to Article 12 of Document 00 7200 (General Conditions).

C.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

[COST PROPOSAL FORM FOLLOWS ON NEXT PAGE]

COST PROPOSAL (CP)

Owner **Public Safety Building Jail Automation Upgrades**
 Contract Number _____

CP Number: _____
 Date: _____
 In Response To _____
 RFP #, etc.

To: City of Berkeley
Attention: Uriel Gonzalez
1947 Center Street, 5th Floor
Berkeley, CA 94704
 Phone: (510) 981-6400
 Fax: (510) 981-6390

From: [Insert Contractor's Name/Address] _____

This Cost Proposal is in response to the above-referenced _____ [insert RFP, etc. as applicable].
 Brief description of change(s): _____

ITEM DESCRIPTION	PRIME CONTRACTOR	SUB 1	SUB 2	SUB 3	SUB 4	TOTAL
MATERIAL						
LABOR						
EQUIPMENT						
Other (Specify) Extended Overhead						
TOTAL COST						
Subcontractor's Overhead & Profit 15 percent						
Contractor's Overhead & Profit 15 percent						
Overhead & Profit to Contractor for Subcontractor's Work 5 percent						
(percent of Total Cost above not including any Overhead & Profit – may not exceed 20%)						
GRAND TOTAL						
REQUESTED CHANGE IN CONTRACT TIME (CALENDAR DAYS)						
(Time Impact Evaluation Enclosed)						

By Contractor: _____

Signature: _____

Date: _____

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DIVISION 1 GENERAL REQUIREMENTS**SECTION 01 3119****PROJECT MEETINGS****PART 1 - GENERAL****1.01 SUMMARY****A. Summary**

1. Section includes description of required project meetings.

1.02 PRECONSTRUCTION CONFERENCE

- A. Preconstruction Conference. City will call for and administer Preconstruction Conference at time and place to be announced (usually the week prior to start of Work at the Site). Contractor, all major Subcontractors, and major suppliers shall attend Preconstruction Conference. Agenda may include, but not be limited to, the following items:

1. Schedules
2. Personnel and vehicle permit procedures
3. Use of premises
4. Location of the Contractor's on-Site facilities & Temporary Utilities
5. Security
6. Housekeeping
7. Submittal and RFI procedures
8. Inspection and testing procedures, on-Site and off-Site
9. Utility shutdown procedures
10. Control and reference point survey procedures
11. Injury and Illness Prevention Program
12. Contractor's Initial Progress Schedule
13. Contractor's Schedule of Values
14. Contractor's Schedule of Submittals
15. Jurisdictional agency requirements
16. Project Communication Procedures
17. Modification Procedures
18. Site Access by City and Consultants
19. As-Built/Record Documents
20. Permits & Fees
21. Coordination: (Work Performed for City under separate contract). (As Appropriate)
22. City will distribute copies of minutes to attendees. Attendees shall have 7 calendar days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Preconstruction Conference.

1.03 WEEKLY PROJECT MEETINGS

- A. City will schedule and administer weekly progress meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by City. Meetings shall be held at City's Offices unless otherwise specified in Contract Documents.
1. City's Representative will prepare agenda and distribute it 4 calendar days in advance of meeting to Contractor.
 2. Participants with agenda items shall present them.
 3. The Architect/Engineer and other responsible entities shall attend meetings unless otherwise

specified in Contract Documents or provided by City.

4. City shall record and distribute the meeting minutes. Minutes shall be distributed by the City to the Contractor within 3 business days after the meeting. Contractor shall distribute the minutes to those affected by decisions made at meeting. Attendees shall have five business days to submit comments or additions to the minutes. Minutes shall constitute final memorialization of results of meeting.
5. Progress meetings shall be attended by Contractor's job superintendent, major Subcontractors and suppliers, City, and others as appropriate to agenda topics for each meeting.
6. Agenda may contain the following items, as appropriate:
 - a. Review, revise as necessary, and approve previous meeting minutes
 - b. Review of Work progress since last meeting
 - c. Status of Construction Work Schedule, delivery schedules, adjustments
 - d. Submittal, RFI, and Change Order status
 - e. Review of the Contractor's safety program activities and results, including report on all serious injury and/or damage accidents
 - f. Other items affecting progress of Work

1.04 PROGRESS SCHEDULE AND BILLING MEETINGS

- A. A meeting will be held on approximately the 20th of each month to review the schedule update submittal and progress payment application.
- B. At this meeting, at a minimum, the following items will be reviewed:
 1. Percent complete of each activity;
 2. Time impact evaluations for Change Orders and Time Extension Request;
 3. Actual and anticipated activity sequence changes;
 4. Actual and anticipated duration changes; and
 5. Actual and anticipated Contractor delays.
 6. Waste Management Tracking/Tags
 7. As-Built/Record Documents
- C. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, Contractor's General Superintendent and Scheduler shall attend these meetings.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS**SECTION 01 3230****PROGRESS SCHEDULES AND SUBMITTALS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section includes description of requirements and procedures for submitting progress schedules and submittals.

1.02 CONTRACTOR TO SUBMIT PROGRESS SCHEDULES

- A. Contractor shall submit original (baseline) progress schedule two weeks prior to the first Application for Payment.
- B. Baseline Progress Schedule shall show Contractor's construction and procurement activities, including but not limited to, equipment procurement and delivery (Contractor and City supplied), activities with Subcontractors and suppliers, major submittal reviews, commissioning of systems, use of major equipment on site, and necessary interface with City and third parties required to complete the Work in a timely manner and in accordance with Contract Time.

1.03 SCHEDULE REQUIREMENTS.

- A. Unless City agrees in writing otherwise, progress schedule shall be on Microsoft Project, Primavera P6, Suretrack, or equivalent software, as City may specify, which Contractor shall prepare and supply to City, with all datapoint entries completed for start dates, necessary work activities, durations (not longer than 21 calendar days) and logic ties.
- B. Contractor's progress schedule may be in the form of a CPM (arrow) diagram or, if City agrees in writing, a bar chart or a Gantt chart. The hard copies of the schedule supplied to City shall indicate the critical path of the Work (in red) and shall show a logical progression of the Work through completion within Contract Time.
- C. Unless City agrees in writing otherwise, progress schedule shall also show early and late start and finish dates and total available float (float to the successor activity's late start date) for each activity. City has no obligation to accept an early completion schedule.

1.04 MONTHLY UPDATES

- A. Contractor's progress schedule shall be updated monthly to reflect actual progress. The schedule shall be subject to City's review and acceptance for use in monitoring Contractor's Work and evaluating Applications for Payment.
- B. Contractor shall supply City with an electronic copy of the updated progress schedule with each monthly payment application. Contractor shall provide City with **three-week** look ahead schedules weekly, showing in detail and activities and resources scheduled for the immediate two week period.

1.05 RECOVERY SCHEDULE

- A. City may request a recovery schedule should Contractor fall 21 or more calendar days behind any schedule Milestone, which schedule shall show Contractor's plan and resources committed to retain Contract completion dates.
- B. The recovery schedule shall show the intended critical path. If City requests, Contractor shall also:
 - 1. Secure and demonstrate appropriate Subcontractor and supplier consent to the recovery

Schedule.

2. Submit a narrative explaining trade flow and construction flow changes and man-hour loading assumptions for major Work activities and/or Subcontractors.

1.06 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, TIME EXTENSIONS AND DELAYS:

- A. When Contractor requests a time extension for any reason, Contractor shall submit a TIE that includes both a written narrative and a schedule diagram depicting how the changed Work or other impact affects other schedule activities. The schedule diagram shall show how Contractor proposes to incorporate the changed Work or other impact in the schedule and how it impacts the current Schedule update critical path or otherwise. Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram shall be tied to the main sequence of scheduled activities to enable City to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor is responsible for all costs associated with the preparation of TIE's, and the process of incorporating TIE's into the current schedule update. Provide City with four copies of each TIE.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS**SECTION 01 3300****SUBMITTALS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section includes description of requirements and procedures for submittals.

1.02 SCHEDULE OF SUBMITTALS

- A. Contractor shall prepare for City's review and acceptance prior to commencement of work on the Site, for purposes of contract administration, a schedule of submittals (also referred to as a submittal register) required to complete the Work, prepared by Contractor and accepted by City for contract administration. Schedule of submittals shall include, for each submittal: the specification or drawing reference requiring the submittal, if applicable; the material, item, or process for which the submittal is required; the submittal number and identifying title of the submittal; the Contractor's anticipated submission date and the approval need date.
- B. Contractor shall update monthly the schedule of submittals to reflect actual submission and acceptance dates for submittals. Review by City of schedule of submittals does not excuse Contractor of obligation to supply, schedule and coordinate all submittals required by the Contract Documents.

1.03 CONTRACTOR TO SUBMIT SHOP DRAWINGS, PRODUCT DATA AND SUBMITTALS.

- A. Contractor shall review for compliance with Contract Documents, approve and submit to City Shop Drawings, Product Data, Samples and similar submittals required by Contract Documents.
- B. Contractor shall schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Contractor shall include certifications to be submitted with the pertinent drawings at the same time.
- C. Contractor shall coordinate scheduling, sequencing, preparing and processing of all submittals with performance of work so that work will not be delayed by submittal processing.
- D. Submittals shall specifically identify any Work depicted that does not conform to the Contract Documents.

1.04 CITY REVIEW OF SHOP DRAWINGS, PRODUCT DATA AND SUBMITTALS.

- A. After review by City of each Submittal, material will be returned to Contractor with actions defined as follows:
 - 1. NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with general design concept of the Work, future Submittals and additional partial Submittals for any portions of the Work not covered in this Submittal. Does not constitute acceptance or deletion of specified or required items not shown on the Submittal.
 - 2. MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as item 1 above, except that minor corrections as noted shall be made by Contractor.
 - 3. REVISE AS NOTED AND RESUBMIT - Rejected because of major inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by City.
 - 4. REJECTED - RESUBMIT - Submitted material does not conform to Drawings and/or Specifications in major respect, i.e.: wrong size, model, capacity, or material.

- B. Favorable review will not constitute acceptance by City of any responsibility for the accuracy, coordination, or completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back-check comments, corrections, and modifications from City's review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals, but Contractor shall ascertain that Submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. City's review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of Submittal, method of Work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by City, or any officer or employee thereof, and Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of Work or material and equipment so accepted. Favorable review shall be considered to mean merely that City has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials and equipment proposed.
- C. Unless otherwise specified, City's review will not extend to the means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- D. Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been favorably reviewed by the City; otherwise, any such Work is at Contractor's sole risk.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Regulatory requirements applicable to Contract Documents
2. Required provisions under Local Agency Disputes Act
3. Required references under federal law

1.02 GENERAL

A. Compliance with Laws

1. Conform to all applicable codes, laws, ordinances, rules and regulations, which shall have full force and effect as though printed in full in these Specifications. Codes, laws, ordinances, rules, regulations and ordinances (**Regulatory Requirements**) are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements.
2. Any listing of Regulatory Requirements for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor's responsibility for complying with all applicable Regulatory Requirements having application to the Work. Where conflict among the Regulatory Requirements or with these Specifications occurs, the most stringent requirements shall be used.
3. Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

B. Precedence

1. Where specified requirements differ from Regulatory Requirements, the more stringent requirements shall take precedence. Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by Regulatory Requirements, then Drawings and Specifications shall take precedence so long as such increase is legal. Where no requirements are identified on Drawings or in Specifications, comply with all Regulatory Requirements of governing authorities having jurisdiction.
2. Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a Change Order detailing and specifying the required Work shall be submitted to and approved by City before proceeding with the Work.

1.03 REGULATORY REQUIREMENTS

A. Applicable Codes

1. Codes that apply to Contract Documents include all Codes applicable to construction, including, but not limited to, the following:
 - a. California Building Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.

- b. California Electrical Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
- c. California Plumbing Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for plumbing, sewage disposal and health requirements.
- d. California Mechanical Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
- e. California Energy Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
- f. California Green Building Standard Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
- g. International Fire Code (2016 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
- h. California Administrative Code Titles 15, 19 and 24 (with California amendments), and Americans with Disabilities Act (ADA) accessibility guidelines, whichever is more stringent.
- i. All State laws and City and County Ordinances, rules of the State or City or County Health Departments, rules of the National Board of Fire Underwriters and National Fire Protection Associations, and local power company regulations for mechanical and electrical work.

B. Applicable Laws, Statutes, Ordinances, Rules, And Regulations

- 1. During prosecution of Work to be done under Contract Documents, Contractor shall comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:
 - a. Federal:
 - 1) Americans With Disabilities Act of 1990
 - 2) 29 CFR, Section 1910.1001, Asbestos
 - 3) 40 CFR, Subpart M, National Emission Standards for Asbestos
 - 4) Executive Order 11246
 - 5) Federal Endangered Species Act
 - 6) Clean Water Act
 - b. State of California:
 - 1) California Code of Regulations, Titles 5, 8, 17, 19, 21, 22, 24 and 25
 - 2) California Public Contract Code
 - 3) California Health and Safety Code
 - 4) California Government Code
 - 5) California Labor Code
 - 6) California Civil Code
 - 7) California Code of Civil Procedure
 - 8) CPUC General Order 95, Rules for Overhead Electric Line Construction
 - 9) CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
 - 10) Cal/OSHA
 - 11) OSHA: Hazard Communications Standards
 - 12) California Endangered Species Act
 - 13) Water Code
 - 14) Fish and Game Code
 - c. State of California Agencies:
 - 1) State and Consumer Services Agency
 - 2) Office of the State Fire Marshall
 - 3) Office of Statewide Health Planning and Development
 - 4) Department of Fish and Game
 - 5) All Air Quality Management Districts with jurisdiction
 - 6) All Regional Water Quality Control Boards with jurisdiction
 - 7) Division of the State Architect (if having jurisdiction)
 - d. All Local Agencies with jurisdiction (cities, counties, fire departments)

C. Change Orders and Claims:

1. The California Public Contract Code, including but not limited to Section 7105(d)(2), and the California Government Code Section 930.2 et seq., apply to all contract procedures for changes, time extensions, change orders (time or compensation) and claims. Federal law (U.S. v. Holpuch 326 U.S. 234) shall supplement California law on the enforceability of these requirements.
2. Any change, waiver, or omission to implement contract change order and claim procedures shall have no legal effect unless expressly permitted in a fully executed change order approved by Contractor and City and approved as to form by their respective legal counsel.

D. Required Provisions On Contract Claim Resolution

1. The California Public Contract Code specifies required provisions on resolving contract claims less than \$375,000, which are set forth below, and constitute a part of this Contract.
2. For the purposes of this section, "Claim" means a separate demand by Contractor of \$375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by City. In order to qualify as a Claim, the written demand must state that it is a Claim submitted under paragraph 12 of Document 00 7200 (General Conditions) and be submitted in compliance with all requirements of Document 00 7200 (General Conditions), paragraph 12. Separate Claims which total more than \$375,000 do not qualify as a "separate demand of \$375,000 or less," as referenced above, and are not subject to this section.
3. A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in compliance with Contract Documents claim submission requirements.
4. Caution. This section does not apply to tort claims and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.
5. Procedure:
 - a. The Claim must be in writing, submitted in compliance with all requirements of Document 00 7200 (General Conditions), paragraph 12, including, but not limited to, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Document 00 7200 (General Conditions), paragraph 12.3. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 00 7200 (General Conditions), paragraph 12 or elsewhere in the Contract Documents.
 - b. For Claims of fifty thousand dollars (\$50,000) or less, City shall respond in writing within forty-five (45) calendar days of receipt of the Claim, or City may request in writing within thirty (30) calendar days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims City may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section upon mutual agreement of City and Claimant. City's written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) calendar days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
 - c. For Claims over Fifty Thousand Dollars (\$50,000) and less than or equal to \$375,000: City shall respond in writing within sixty (60) calendar days of receipt of the Claim, or City may request in writing within thirty (30) calendar days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims City may have against Claimant. If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of City and Claimant;

City's written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) calendar days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

- d. Meet and Confer: If Claimant disputes City's written response, or City fails to respond within the time prescribed above, Claimant shall notify City, in writing, either within fifteen (15) calendar days of receipt of City's response or within fifteen (15) calendar days of City's failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand City will schedule a meet and confer conference within thirty (30) calendar days for settlement of the dispute.
- e. Following the meet and confer conference, if the Claim or any portion remains in dispute, Claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Claimant submits its written claim as set forth herein, until the time that Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

E. Compliance With Americans With Disabilities Act

- 1. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a Contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under the Contract Documents and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of the Contract Documents.

F. Compliance With IRCA

- 1. Contractor acknowledges that Contractor, and all subcontractors hired by Contractor to perform services under this Agreement, are aware of and understand the immigration Reform and Control Act ("IRCA"). Contractor is and shall remain in compliance with the IRCA and shall ensure that any subcontractors hired by Contractor to perform services under this Agreement are in compliance with the IRCA. In addition, Contractor agrees to indemnify, defend and hold harmless City, its agents, officers and employees, from any liability, damages or causes of action arising out of or relating to any claims that Contractor's employees, or employees of any subcontractor hired by Contractor, are not authorized to work in the United States for Contractor or its subcontractor and/or any other claims based upon alleged IRCA violations committed by Contractor or Contractor's subcontractors.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 4200**REFERENCES AND DEFINITIONS****PART 1 - GENERAL****1.01 SUMMARY****A. Section Includes:**

1. Reference standards, abbreviations, symbols, and definitions used in Contract Documents.
2. Full titles are given in this Section for standards cited in other Sections of Specifications.

**1.02 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES;
REPORTING AND RESOLVING DISCREPANCIES****A. References**

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
2. If during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual, or code or of any instruction of any supplier, Contractor shall report it in writing at once to City's Representative and Architect/Engineer, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by City.

B. Precedence

1. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, CCD, or Supplemental Instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
2. No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of City, City's Representative, Architect/Engineer or Contractor, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to City, Architect/Engineer, or any of their consultants, agents, representatives or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

C. Referenced Grades, Classes, and Types:

1. Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the highest, best, and

greatest of the alternatives or options for the intended use and prevailing conditions.

D. Edition Date of References:

1. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of opening Bids.
2. All amendments, changes, errata and supplements as of the effective date shall be included.

E. **ASTM and ANSI References:** Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision, or amendment. It is presumed that Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

1.03 DEFINITIONS

A. Meaning of Words and Phrases

Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth. Where abbreviations and symbols are used, such abbreviations and symbols shall be given their common meaning in the construction industry. In the Contract Documents, the neuter gender includes the feminine and masculine, and the singular number includes the plural.

While City has made an effort to identify all defined terms with initial caps, the following definitions shall apply regardless of case unless the context otherwise requires:

1. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-Bid Conference and/or Site Visit.
2. Agreement (Document 00 5200): Agreement is the basic Contract Document that binds the parties to construction Work. Agreement defines relationships and obligations between City and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract Documents.
3. Alternate: Work added to or deducted from the base Bid, if accepted by City.
4. Application for Payment: Written application for monthly or periodic progress or final payment made by Contractor complying with the Contract Documents.
5. Approved Equal: Approved in writing by City as being of equivalent quality, utility and appearance.
6. Architect/Engineer: If used elsewhere in the Contract Documents, "Architect/Engineer" shall mean a person (or that person's firm) holding a valid California State Architect's or Engineer's license representing the City in the administration of the Contract Documents. Architect/Engineer may be an employee of or an independent consultant to City. When Architect/Engineer is referred to within the Contract Documents and not an employee of City, Architect/Engineer shall be construed to include employees of Architect/Engineer and/or employees that Architect/Engineer supervises. When the designated Architect/Engineer is an employee of City, his or her authorized representatives on the Project will be included under the term Architect/Engineer. If Architect/Engineer is an employee of City, Architect/Engineer is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities. Architect/Engineer may also be referred to as Architect or Engineer.
7. Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.

8. Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.
9. Bidder: One who submits a Bid.
10. Bidding Documents: All documents comprising the Project Manual (including all documents and Specification Sections listed in Document 00 0110 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.
11. Board: The governing body of the City.
12. Business Day: Any Day other than Saturday, Sunday, and the following days that have been designated as holidays by City. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday.
 - a. New Year's Day, January 1;
 - b. Martin Luther King Jr.'s Birthday, third Monday in January;
 - c. Lincoln's Birthday, February 12;
 - d. Presidents' Day, third Monday in February;
 - e. Malcolm X Day, third Friday in May;
 - f. Memorial Day, last Monday in May;
 - g. Juneteenth, June 19;
 - h. Independence Day, July 4;
 - i. Labor Day, first Monday in September;
 - j. Indigenous People's Day, second Monday in October;
 - k. Veterans' Day, November 11;
 - l. Thanksgiving Day, as designated by the President;
 - m. The Day following Thanksgiving Day;
 - n. Christmas Day, December 25; and
 - o. Each day appointed by the Governor of California and formally recognized by the Governing Board as a day of mourning, thanksgiving, or special observance.
13. By City: Work that will be performed by City or its agents at the City's expense.
14. By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by City, other contractors, or other means.
15. Change Order: A written instrument prepared by City and signed by City and Contractor, stating their agreement upon all of the following:
 - a. a change in the Work;
 - b. the amount of the adjustment in the Contract Sum, if any; and
 - c. the amount of the adjustment in the Contract Time, if any.
16. Change Proposal Request (CPR): A document prepared by Contractor requesting or initiating a request for modifying the Contract Documents and determining costs for changes in contract amount and any requested changes to Contract Time.
17. City: City is defined in Document 00 5200 (Agreement).
18. City-Furnished, Contractor Installed: Items furnished by City at its cost for installation by Contractor at its cost under Contract Documents.
19. City's Representative(s): See Document 00 5200 (Agreement).
20. Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.
21. Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.
22. Construction Change Directive ("CCD"): A written order prepared and signed by City, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.

23. Contract Amount: a change order price, line item price, Contract Sum, or other price assigned to a scope of work.
24. Contract Conditions or Conditions of the Contract: Consists of two parts: General Conditions and Supplementary Conditions.
- a. General Conditions are general clauses that are common to the City Contracts, including Document 00 7200 (General Conditions).
 - b. Supplementary Conditions modify or supplement General Conditions to meet specific requirements for Contract Documents, including Document 00 7201 (Supplementary Conditions).
25. Contract Documents and Contract: Contract Documents and Contract shall consist of the documents identified as the Contract Documents in Document 00 5200 (Agreement), plus all changes, Addenda, and modifications thereto.
26. Contract Modification: Either:
- a. a written amendment to Contract signed by Contractor and City; or
 - b. a Change Order; or
 - c. a Construction Change Directive; or
 - d. a written directive for a minor change in the Work issued by City.
27. Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by City to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.
28. Contract Time: The number or numbers of calendar days or the dates stated in the Agreement to achieve Substantial Completion of the Work or designated Milestones; and/or to achieve Final Completion of the Work so that it is ready for final payment and is accepted.
29. Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term "Contractor" means the Contractor or its authorized representative.
30. Contractor's Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.
31. Day: One calendar day of 24 hours measured from midnight to the next midnight, unless the word "day" is specifically modified to the contrary.
32. Defective: An adjective which, when modifying the word "Work," refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of Samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by City). Unapproved substitutions are defective. City is the judge of whether Work is Defective.
33. Division of State Architect: A division of the State of California providing, design and construction oversight for K-12 schools and community colleges, and developing and maintaining accessibility standards and codes utilized in public and private buildings throughout the State of California.
34. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
35. Equal: Equal in opinion of City. Burden of proof of equality is responsibility of Contractor.
36. Final Acceptance or Final Completion: City's acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final

Completion include, but are not limited to:

- a. Final cleaning is completed.
 - b. All systems having been tested and accepted as having met requirements of Contract Documents.
 - c. All required instructions and training sessions having been given by Contractor.
 - d. All Project Record Documents having been submitted by Contractor, reviewed by City, and accepted by City.
 - e. All punch list Work, as directed by City, having been completed by Contractor.
 - f. Generally all Work, except Contractor maintenance after Final Acceptance/Final Completion, having been completed to satisfaction of City.
37. Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
38. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
39. Furnish: Supply Indicated: Shown or noted on the Drawings.
40. Indicated: Shown or noted on the Drawings.
41. Install: Install or apply only, do not furnish.
42. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under Document 00 7200 (General Conditions).
43. Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions.
44. Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
45. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
46. Modification: Same as Contract Modification.
47. Not in Contract or "NIC": Work that is outside the scope of Work to be performed by Contractor under Contract Documents.
48. Notice of Completion: Shall have the meaning provided in California Civil Code §3093, and any successor statute.
49. Off Site: Outside geographical location of the Project.
50. Owner: Owner is the City of Berkeley, see Document 00 5200 (Agreement).
51. Partial Utilization: Use by City of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.
52. PCBs: Polychlorinated byphenyls.
53. Phase: A specified portion of the Work (if any) specifically identified as a Phase in Document 00 5200 (Agreement) or Document 01 1100 (Summary).
54. Product Data: That information (brochures, catalog sheets, manufacturer's cut sheets, etc.) supplied by vendors having technical and commercial characteristics of the supplied equipment or materials and accompanying commercial terms such as warranties, instructions, and manuals.
55. Progress Report: A periodic report submitted by Contractor to City with progress payment

invoices accompanying progress schedule. See Document 00 7200 (General Conditions).

56. Project: Total construction of which Work performed under Contract Documents may be whole or part.
57. Project Manager: If used elsewhere in the Contract Documents, "Project Manager" shall mean a person representing the City in the administration of the Contract Documents. Project Manager may be an employee of or an independent consultant to City. When Project Manager is referred to within the Contract Documents and no Project Manager has in fact been designated, then the matter shall be referred to City. The term Project Manager shall be construed to include employees of Project Manager and/or employees that Project Manager supervises. When the designated Project Manager is an employee of City, his or her authorized representatives on the Project will be included under the term Project Manager. If Project Manager is an employee of City Project Manager is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.
58. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, Drawings, and Specifications.
59. Project Record Documents: All Project deliverables required under the Contract Documents, including without limitation, as built drawings; Installation, Operation, and Maintenance Manuals; and Machine Inventory Sheets.
60. Provide: Furnish and install.
61. Request for Information ("RFI"): A document prepared by Contractor requesting information regarding the Project or Contract Documents. The RFI system is also a means for City to submit Contract Document clarifications or supplements to Contractor.
62. Request for Proposals ("RFP"): A document issued by City to Contractor whereby City may initiate changes in the Work or Contract Time as provided in Contract Documents.
63. Request for Substitution ("RFS"): A document prepared by Contractor requesting substitution of materials as permitted and to the extent permitted in Contract Documents.
64. RFI-Reply: A document consisting of supplementary details, instructions, or information issued by City that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by City. RFI-Replies will be issued through the RFI administrative system.
65. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
66. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
67. Shown: As indicated on Drawings.
68. Site: The particular geographical location of Work performed pursuant to the Contract Documents.
69. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services.
70. Specified: As written in Specifications.
71. Subcontractor: A person or entity that has a direct contract with Contractor to perform a portion of the Work at the Site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and neutral in gender and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a

separate contractor or subcontractors of a separate contractor.

72. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of City as evidenced by a notice or certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended, and unperformed or incomplete work elements are minor in nature; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of City for final payment. The terms "Substantially Complete" and "Substantially Completed" as applied to all or part of the Work refer to Substantial Completion thereof.
73. Supplemental Instruction: A written directive from City to Contractor ordering alterations or Modifications that do not result in change in Contract Sum or Contract Time, and do not substantially change Drawings or Specifications.
74. Testing and Special Inspection Agency: An independent entity engaged to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
75. Time Impact Evaluation (TIE): A written narrative and a schedule diagram depicting how the changed Work or other impact affects other scheduled activities, prepared by Contractor in conjunction with a Change Proposal Request (CPR) for Change Orders, Time Extensions, and Delays. See Document 01 3230 (Progress Schedules and Submittals), and Document 01 2600 (Modification Procedures).
76. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: Electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems, or water.
77. Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Document 00 5200 (Agreement) or Section 01 1100 (Summary).
78. Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word "work" is used, rather than the word "Work," it shall be understood to have its ordinary and customary meaning.

B. Other Defined Terms

The following terms are not necessarily identified with initial caps; however they shall have the meaning set forth below:

1. Wherever words "as directed," "as required," "as permitted," or words of like effect are used, it shall be understood that direction, requirements, or permission of City is intended. Words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary, or proper in judgment of City. Words "approved," "acceptable," "satisfactory," "favorably reviewed," or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by City.
2. Wherever the word "may" or "ought" is used, the action to which it refers is discretionary. Wherever the word "shall" or "will" is used, the action to which it refers is mandatory.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS**SECTION 01 4500****TESTING AND INSPECTION****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section Includes:
 - 1. Regulatory requirements for testing and inspection.
 - 2. Contractor's quality control.
 - 3. Quality of the Work.
 - 4. Inspections and tests by governing authorities.
 - 5. Inspections and tests by serving utilities.
 - 6. Inspections and tests by manufacturer's representatives.
 - 7. Inspections by Independent Testing and Inspection Agency.

1.02 RELATED SECTIONS

- A. Document 00 7200 General Conditions
- B. Section 01 4100 Regulatory Requirements

1.03 CONTRACTOR'S QUALITY CONTROL

- A. Contractor's Quality Control: Contractor shall ensure that products, services, workmanship and site conditions comply with requirements of the Drawings and Specifications by coordinating, supervising, testing and inspecting the work and by utilizing only suitably qualified personnel.
- B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.
- C. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

1.04 QUALITY OF THE WORK

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.
- B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.
- C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling and staining, until Acceptance by the City.
- D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report

requirements in preparing, fabricating erecting, installing, applying, connecting and finishing Work.

- E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
- F. Verification of Quality: Work shall be subject to verification of quality by City or Architect/Engineer in accordance with provisions of the General Conditions of the Contract.
 - 1. Contractor shall cooperate by making Work available for inspection by City, Architect/Engineer or their designated representatives.
 - 2. Such verification may include mill, plant, shop, or field inspection as required.
 - 3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
 - 4. Provide all information and assistance as required, including that by and from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by City or Architect/Engineer.
 - 5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions of the Contract.
- G. Observations by Architect/Engineer: Periodic and occasional observations of Work in progress will be made by Architect/Engineer as deemed necessary to review progress of Work and general conformance with design intent.
- H. Limitations on Inspection, Test and Observation: Neither employment of independent testing and inspection agency nor observations by Architect/Engineer shall in way relieve Contractor of obligation to perform Work in full conformance to all requirements of Contract Documents.
- I. Rejection of Work: City reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications.
- J. Correction of Non-Conforming Work: Non-conforming Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time.
- K. Acceptance of Non-Conforming Work: Acceptance of nonconforming Work, without specific written acknowledgement and approval of the City, shall not relieve the Contractor of the obligation to correct such Work.
- L. Contract Adjustment for Non-Conforming Work: Should City determine that it is not feasible or in City's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between City and Contractor. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions.

1.05 INSPECTIONS AND TESTS BY GOVERNING AUTHORITIES

- A. Regulatory Requirements for testing and Inspection: Comply with Uniform Building Code (UBC) requirements and all other requirements of governing authorities having jurisdiction.
- B. Inspections and Tests by Governing Authorities: Contractor shall cause all tests and inspections required by governing authorities having jurisdiction to be made for Work under this Contract.
 - 1. Such authorities include the Division of Occupational Safety and Health (Cal/OSHA), City of Berkeley Public Works Department, Fire Department, and similar agencies.
 - 2. Except as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.06 INSPECTIONS AND TESTS BY SERVING UTILITIES

- A. Inspections and Tests by Serving Utilities: Contractor shall cause all tests and inspections required by serving utilities to be made for Work under this Contract. Scheduling conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.07 INSPECTIONS AND TESTS BY MANUFACTURER'S REPRESENTATIVES

- A. Inspections and Tests by Manufacturer's Representatives: Contractor shall cause all tests and inspections specified to be conducted by materials or systems manufacturers to be made. Additionally, all tests and inspections required by materials or systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum.

1.08 INSPECTIONS BY INDEPENDENT TESTING AND INSPECTION AGENCY

- A. City will select an independent testing and inspection agency or agencies to conduct tests and inspections as indicated on Drawings, in Specifications and as required by governing authorities having jurisdiction.
- B. Responsibility for payment for tests and inspections shall be as indicated in schedule below. All time and costs for Contractor's service related to such tests and inspections shall be included in Contract Time and Contract Sum.
- C. Contractor shall notify City and, if directed by City, testing and inspection agency, when Work is ready for specified tests and inspections.
- D. Contractor shall pay for all additional charges by testing and inspection agencies and governing authorities having jurisdiction due to the following:
1. Contractor's failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
 2. Changes in sources, lots or suppliers of products after original tests or inspections.
 3. Changes in means methods, techniques, sequences and procedures of construction which necessitate additional testing, inspection and related services.
 4. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.
- E. Tests and inspections shall include the following:
- | <u>Section</u> | <u>Inspections and Tests</u> | <u>Paid by</u> |
|--|-------------------------------------|--------------------------------|
| Section 321312-
Concrete Reinforcing
& Miscellaneous Steel | Reinforcement strength | Paid by City. |
| Section 321313-
Cast-in-Place Concrete | Slump Tests
Compressive strength | Paid by City.
Paid by City. |
| Section 050523
Metal Fastenings | Anchor Bolt | Paid by City. |
- F. Test and Inspection Reports: After each inspection and test, one copy of report shall be promptly submitted each to Architect/Engineer, City, City's field representative, Contractor and to agency having jurisdiction (if required by Code).

1. Reports shall clearly identify the following:
 - a. Date issued.
 - b. Project name and number.

- c. Identification of product and Specifications Section in which Work is specified.
 - d. Name of inspector.
 - e. Date and time of sampling or inspection.
 - f. Location in Project where sampling or inspection was conducted.
 - g. Type of inspection or test.
 - h. Date of test.
 - i. Results of tests.
 - j. Comments concerning conformance with Contract Documents and other requirements.
2. Test reports shall indicate specified or required values and shall include statement whether test results indicate satisfactory performance of products.
 3. Samples taken but not tested shall be reported.
 4. Test reports shall confirm that methods used for sampling and testing conform to specified test procedures.
 5. When requested, testing and inspection agency shall provide interpretations of test results.
 6. Verification reports shall be prepared and submitted, stating that tests and inspections specified or otherwise required for the project, have been completed and that material and workmanship comply with the Contract Drawings and Specifications. Verification reports shall be submitted at intervals not exceeding 6 months, at Substantial Completion of the Project, and at all times when Work of Project is suspended.
- G. Contractor Responsibilities in Inspections and Tests:
1. Notify testing and inspection agencies 24 hours in advance of expected time for operations requiring inspection and testing services.
 2. Deliver to laboratory or designated location, adequate samples of materials proposed to be used which require advance testing, together with proposed mix designs.
 3. Cooperate with testing and inspection agency personnel, City's field representative, Architect/Engineer. Provide access to Work areas and off-site fabrication and assembly locations, including during weekends and after normal work hours.
 4. Provide incidental labor and facilities to provide safe access to Work to be tested and inspected, to obtain and handle samples at the Project site or at source of products to be tested, and to store and cure test samples.
 5. Provide, at least 15 calendar days in advance of first test or inspection of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.
 6. Provide 24 hours advance notice to the Project Manager, Architect/Engineer of each test and inspection, as directed.
 - a. When tests or inspections cannot be performed after such notice, reimburse City for Testing Laboratory personnel and travel expenses incurred due to Contractor's negligence.

1.09 ADDITIONAL TESTING AND INSPECTION

- A. If initial tests or inspections made by the Testing Laboratory reveal that materials do not comply with Contract Documents, or if City has reasonable doubt that materials do not comply with Contract Documents, additional tests and inspections shall be made as directed.
 1. If additional tests and inspections establish that materials comply with Contract Documents, all costs for such tests and inspections shall be paid by City.
 2. If additional tests and inspections establish that materials do not comply with Contract Documents, all costs of such tests and inspections shall be paid by the contractor.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 5200

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. General Conditions Document 00 7200
- B. Supplemental General Conditions Document 00 7201

1.02 SUMMARY

- A. This section describes the temporary facilities required for the Project site. The Project site shall be maintained by Contractor as set forth in this section unless otherwise added to or superseded by the requirements of Document 00 7200 (General Conditions).

1.03 TEMPORARY FACILITIES

- A. Contractor shall obtain permits for, install and maintain in safe condition, whatever scaffolds, hoisting equipment, barricades, walkways, or other temporary structures which may be required to accomplish the work on the Project. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable State and local codes and regulations.
- B. Contractor shall provide and maintain temporary heat from an approved source whenever in the course of the Work it may become necessary for curing and drying of materials, or to warm spaces as may be required for the installation of materials or finishes.
- C. Contractor shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the Project. If it is necessary for dewatering to occur continually, Contractor shall have on hand whatever spare parts or equipment that may be required to prevent interruption of dewatering.
- D. Contractor shall provide and maintain all utility services necessary to perform the work under this Contract.
- E. Materials, tools, accessories, etc., shall be stored only where directed by City. Storage area shall be kept neat and clean. Security of stored items shall be Contractor's responsibility.
- F. Flammable materials stored on site, shall be stored in a safe and secure manner per the manufacture's direction. Extra precautions, including clear identification, shall be the responsibility of Contractor.
- G. Contractor shall maintain an office at the Project site that will be his headquarters for the Project. Any communications delivered to this office shall be considered as delivered to Contractor. Location and size of office shall be such that it will adequately serve the needs of Contractor's superintendent and assistants in the performance of their duties.
- H. Contractor shall promptly remove all such temporary facilities when they are no longer needed for the work or for completion of the Project, mutually agreed upon by Contractor and City.
- I. Contractor shall safe-off building prior to demolition.

1.04 SIGNS

- A. No signs may be displayed on or about the City's property (except those required by law) without the City's specific approval; the size, content, and location to be as specified by the City.

1.05 USE OF ROADWAYS AND WALKWAYS

- A. Contractor shall never block or interfere with use of any existing roadway, walkway or other facility for vehicular or pedestrian traffic, from any party entitled to use it. Wherever and whenever such interference becomes necessary for the proper and convenient performance of the Work, and no satisfactory detour route exists, Contractor shall, before beginning the interference, notify City and post signs at least 72 hours in advance of such interference, and provide a satisfactory detour, including temporary bridge if necessary, or other proper facility for traffic to pass around or over the interference. Contractor shall maintain the detour in a safe and satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Specifications.
- B. Contractor shall at all times comply with any and all requirements applying to the work under the transportation, circulation and parking mitigation measures, truck and construction access plan.

PART 2 - PRODUCTS – NOT USED**PART 3 - EXECUTION – NOT USED**

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 5526**TRAFFIC CONTROL**

Contractor shall provide traffic control throughout the project as needed for the various traffic situations and street configurations in full conformance with the latest "California Manual on Uniform Traffic Control Devices and the Federal Highway Administration (FHWA) Manual of Uniform Traffic Control Devices (MUTCD) latest edition, as amended for use in California)" herein after referred to as Traffic Control Manual. The Traffic Control Manual may be obtained online at <https://dot.ca.gov/programs/safety-programs/camutcd/camutcd-files>

As required, the Contractor shall submit a Traffic Control Plan to the City of Berkeley's Transportation Division or the California Department of Transportation (Caltrans).

Construction area signs and temporary traffic control devices shall be furnished, installed, maintained and removed by the Contractor. Traffic signage, e.g., warning signs and detour signs, may be required for this project. Contractor shall be responsible for placing all barricades for perimeter street closures as required. Per Section 501.10 – Traffic Control of the General Provisions, at main entry and exit points of each work location, the Contractor shall provide a 30" x 30" sign advising the public of the anticipated period of time that traffic delays may be anticipated. This sign will also include name and telephone number of the Contractor along with starting and completion dates of the contract. Sign will be erected 7 calendar days in advance of any work.

Construction work requiring traffic control on San Pablo Avenue (State Route 123) or Ashby Avenue (State Route 13) will require an encroachment permit from Caltrans. Contractor is solely responsible for obtaining and abiding by any necessary encroachment permits. The permit fees and other associated costs to obtain the required permits from the State of California shall be included in the cost bid for this item. Contractor shall be responsible for providing traffic control plan for encroachment permit to and obtaining approval of said traffic control plan from State of California. Contractor shall be responsible for all notification of work to, application for and obtaining work authorization number from Caltrans. Any damages arising from work related to encroachment permit shall be the responsibility of the Contractor.

The Contractor shall be responsible for posting "No Parking" signs a minimum of four calendar days in advance of concrete work, paving operations, failed area, and planning work so as to comply with the City's construction notification requirement of 4 days. Cones shall not be used as barricades. "No Parking" signs may be obtained from the City at no cost to the Contractor. The "No Parking" signs shall be updated as necessary. The Contractor shall check and maintain (e.g., re-install missing signs, reposition displaced barricades, etc.) postings on a regular basis prior to start of work.

If traffic is to be detoured over a centerline or detoured in advance of the work, detour plans must be part of the submitted Traffic Control plans and approved by the City prior to starting work. Police, Fire and Public Works Department shall be notified by the contractor at least four calendar days in advance of any work which will interfere with the normal flow of vehicular or pedestrian traffic. Intersection closure may only occur if the two adjacent intersections remain open, unless otherwise approved by the City. The Contractor shall coordinate his traffic control/diversion plan with the City, a minimum of 3 weeks prior to starting work, to assure that traffic is diverted in a safe and convenient manner.

Truck routes shall be approved by the City prior to start of work.

Truck traffic is not allowed on Marin Avenue within the City of Albany. Personal vehicles of the Contractor's employees shall not be parked within the area of work.

A minimum of one (paved) traffic lane, not less than 12 ft. wide, shall remain open for use by public traffic during construction operations. When construction operations are not actively in progress, not less than two such lanes shall be open to public traffic. The Contractor may be allowed to close residential streets if approved in writing in advance by the City. No work that interferes with public traffic shall be performed between 6:00 p.m. and 7:00 a.m.

Start of work shall be no earlier than 7:00 a.m. No work process, including starting, warm up, and delivery of equipment, shall be done outside of work hours. The use of vehicle horns to alert residents to move their vehicles out of the construction zone is not permitted. The Contractor should attempt to locate vehicle owners by knocking on doors.

The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays, and when construction operations are not actively in progress, unless specified otherwise.

Minor deviations from the requirements of this section concerning hours of work may be permitted upon the written request of the Contractor, if in the opinion of the City, public traffic will be better served and the work expedited. Such deviations shall not be adopted until the City provides written approval.

The traffic control system shall consist of closing traffic lanes in accordance with the Traffic Control Manual. Signs and other devices for the traffic control system shall conform to the Traffic Control Manual.

If any component in the traffic control system is damaged, displaced or ceases to operate or function as specified, from any cause during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location.

Lane closures may be made for work periods only. At the end of each work period, all components of the traffic control system shall be removed from the traveled way, shoulder and auxiliary lanes. If the Contractor so elects, said components may be stored at selected central locations approved by the City within the limits of the public right-of-way.

Sufficient barricades and flashing lights shall also be placed to supplement all traffic signs used to divert and control traffic. Signs and barricades shall be checked periodically every day and replaced or repaired as necessary. Any hazardous conditions shall be immediately eliminated.

The Contractor, at the end of each day, shall provide ADA compliant pedestrian and vehicle crossings at all street intersections. If the project is left open overnight, it shall be graded in such a way that pedestrians and vehicles can safely pass through the project. Temporary concrete, asphalt, or wood ramps shall be installed and maintained at all locations where existing ramps have been temporarily removed.

Cleanliness is extremely important. Dust producing conditions shall be eliminated as soon as they are created.

If Contractor violates any of these provisions, a fine of \$1,000 will be assessed for the first violation, \$5,000 for the second and \$10,000 for the third and further subsequent violations.

ACCESS AND EGRESS

The Contractor shall endeavor to cooperate with all business owners and residents occupying properties fronting on the streets in the matter of access and egress. **Contractor shall maintain a clear and accessible pedestrian corridor.**

Where a business property has more than two vehicular paths of access, one path, 10 feet in width, shall remain open during all business hours, unless accepted by the City.

LANE CLOSURES

No lane closures shall be permitted on the following streets Monday through Friday between 7:00 A.M. – 9:00 A.M. and 4:00 P.M. – 6:00 P.M., and Saturdays between 10:00 A.M. – 2:00 P.M., unless approved in advance by the City, if it can be explained why such closure cannot reasonably be avoided. On Saturdays when UC football games are scheduled all construction-related lane closures along these corridors must be reopened at least 4 hours before the start of the game and remain open for 2 hours after the conclusion of the game.

Major Streets:

- University Avenue
- San Pablo Avenue
- Shattuck Avenue
- Telegraph Avenue
- Sacramento Street
- Martin Luther King Jr. Way
- Ashby Avenue
- College Avenue
- Gilman Avenue
- Adeline Street

Notwithstanding the above, the City reserves the right to review and comment on each individual traffic control plan based on its own merits.

Note: Routine maintenance, inconvenience to construction method or schedule, or adverse impacts on cost of work will generally not be accepted as grounds for exceptions.

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS**SECTION 01 5700****TEMPORARY CONTROLS****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. General Conditions Document 00 7200
- B. Supplemental General Conditions Document 00 7201

1.02 SUMMARY

- A. This section describes the temporary controls required for the Project site. The Project site shall be maintained by Contractor as set forth in this section unless otherwise added to or superseded by the requirements of Document 00 7200 (General Conditions).

1.03 TEMPORARY CONTROLS

- A. Contractor shall obtain permits for, install and maintain in safe condition, whatever scaffolds, equipment, shoring, barricades, walkways, or other temporary structures which may be required to accomplish the Work. Such items shall be adequate for the intended use and shall be installed and maintained in accordance with all applicable State and local codes and regulations.
- B. The Contractor shall perform a pre-construction audio/video tape survey and provide supplemental photographic documentation to adequately document the condition of existing improvements. It is the responsibility of the Contractor to adequately document the condition of existing improvements and the Contractor may be held liable for any damage or condition whose pre-existence he/she is unable to document. No additional compensation for such tape survey and still photographs will be allowed.
- C. Upon notification of the City, the Contractor shall correct any deficiencies of the temporary controls within 72 hours. The City may request City crews or contract with another contractor to perform the necessary work and repairs if the deficiencies have not been corrected after the 72-hour notification. The Contractor shall pay the cost of the work performed by the City crews or other contractor plus an additional seventy percent (70%) surcharge by deduction from payment due on the contract.
- D. The Contractor shall begin cleanup operation at least one hour before the end of each day's work, clean all paved portions of the project and paved streets leading from the project that have dust-producing materials or debris deposited upon them. The work areas shall be swept clean at the end of each day's work and at other times when directed by the City.

1.04 DUST AND DEBRIS CONTROLS

- A. The Contractor shall be responsible for controlling dust in the air and rocks, debris, mud or dirt which are scattered as a result of his operations on the job. The Contractor shall be responsible for cleaning all mud, rock, dust, dirt, and debris-producing materials that originate in the project area and are deposited on other public or private property by truck tires, spillages, or by other means. The Contractor shall have suitable and adequate street cleaning equipment on the project site at all times.
- B. The Contractor shall endeavor, whenever possible, to restrict the use of water to control dust for his convenience in order to conserve water during drought situations or

mandated rationing required by the Water Utility Company. Whenever flushing of streets or any other work is necessary, the Contractor shall provide filter materials at the catch basin to retain any debris and dirt flowing into the City's drainage system.

- C. The cost of the above work, including the providing of barricades, water and other materials, labor, and equipment shall be at the sole cost and expense of the Contractor.
- D. The City may determine that an emergency exists when dust, rocks, debris, mud, or dirt are scattered in the public right of way or in the private properties as a result of Contractor's activities and/or deterioration of such conditions due to rain. The emergency conditions may also be declared when traffic or the Contractor's equipment travelling through a job causes dust to fly or rocks, debris, mud, or dirt to be scattered. Similar emergency conditions may be determined by the City's Representative if the storage of materials, tools, or any other equipment related to the project, in the public rights of way, is causing any obstruction or blocks access to the neighboring properties and/or dangerously placed without proper barricades and lights and/or backfill stockpiles or debris washing away into the street gutter and catch basins.

1.05 NOISE CONTROL

- A. Equipment which operates with noise levels in excess of 85 decibels measured on the A-weighted scale defined in ANSI S-1.4 at a distance of 100 feet from the equipment is prohibited.
- B. All equipment and impact tools shall have mufflers to comply with specified noise control.
- C. Use of unusually noisy equipment, such as jackhammers and roto-hammers is prohibited.
- D. Exterior construction work is limited to the hours of 8 AM to 5 PM.
- E. Cooperate with City if an ongoing construction activity becomes objectionable by its longevity, or by overlapping into an activity started later by the City. It is understood and agreed that both parties shall cooperate so that neither will be unduly inconvenienced by this requirement.
- F. Comply by requirements specified in the various sections.

1.06 CLEAN UP

- A. The Contractor shall not allow the site of the work to become littered with trash, rubbish, and waste material but shall maintain the same in a neat and orderly condition throughout the construction period. Cleanup, debris and dust control shall be a daily maintenance requirement. The City shall have the right to determine what is or is not trash, rubbish or waste material and the place and manner of disposal.
- B. The Contractor shall maintain a neat appearance to the work. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solutions from surfaces to prevent marring or other damage.
- C. Broken concrete debris, and unsuitable excavated native soil during construction shall be disposed of concurrently with its removal. If stockpiling is necessary all debris shall be placed in trash bins daily and shall be removed or disposed of weekly. Any waste shall not be buried on the site or disposed of into storm drains, sanitary sewers, streams, or waterways.
- D. Forms or falsework that are to be re-used shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be re-used shall be disposed of concurrently with their removal.
- E. Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.
- F. Sidewalks, street area, parking strips, and driveway approaches must be kept reasonably

clean at all times during construction and be completely and carefully cleaned after the work has progressed beyond the immediate vicinity to the satisfaction of the City's Representative. Reasonable cleanup is defined as no dust, rock, or mud on any portion of the public right-of-way or the private properties as a result of the Contractor's work.

1.07 EMERGENCY CLEAN UP WORK

- A. In any case in which the Contractor fails to satisfactorily complete the cleanup work described in this section, the City may determine that an emergency exists. In the event an emergency is determined by the City, the Contractor will be notified by the City to correct the violation immediately. The Contractor shall immediately make available manual labor or mechanical equipment capable of handling the cleaning process. During such an emergency, City forces may be called upon to complete the cleanup work, or the City may contract for the cleanup work. All construction work shall be shut down during this cleanup work by the City/contract forces. The City may shut down further construction work until the violations are corrected to the satisfaction of the City. The cost of the work performed by City/Contract forces plus an additional 70% surcharge shall be paid by the Contractor by deduction from payment due him on the contract. No compensation shall be given to the Contractor for stoppage of work.
- B. Such action by the City, however, shall not relieve the Contractor of his responsibility for any damages which may occur before, during or after such action has been taken by the City, and shall place no liability upon the City.

1.08 FINAL CLEAN UP

- A. Upon completion of the work, and before acceptance and final payment, the Contractor shall clean the project areas and remove all surplus and discarded materials, falsework, rubbish and temporary structures and restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work, and shall leave the improvement in a neat and presentable condition throughout the entire length of the improvement under contract to the satisfaction of the City. If the Conditions as noted above are not corrected immediately, the City may declare an emergency and take necessary action in accordance with the Emergency Cleanup Work section of this specification.

1.09 CLEAN UP AND SAFETY

- A. If the Contractor stockpiles granular material in the gutter, he must provide a minimum 4" pipe below the stockpile in the gutter to accommodate typical gutter flow. Any lumber or stockpiles on the site, not ready for immediate use, shall be free of nails or torn edges that may cause injury. Any materials stockpiled in the street and any open excavation shall have barricades equipped with operative automatic flashers placed at each end. The Contractor shall maintain a neat appearance at all times. All material removed shall be disposed of off-site in a legal manner.
- B. The Contractor must take special precautions to protect the public and City employees from bodily and property damage resulting from the work. Contractor must exercise all necessary precautions to ensure a safe execution of the work.

1.10 CREEK PROTECTION [OPTIONAL]

- A. The Contractor shall be responsible for and conduct all aspects of the work within the requirements of BMC Chapter 17.08 – PRESERVATION AND RESTORATION OF NATURAL WATERCOURSES (Creek Ordinance), and any other creek protection requirements by other agencies.
- B. Portions of Work involving a creek channel may not be permitted between October 15 through April 15 or other dates as may be stipulated in applicable permits.

- C. Any work between creek banks shall be conducted to not create conditions, which will allow erosion, and shall be fully restored to at least the same erosion resistant condition as before the Work.
- D. Complying with the requirements of creek protection shall include but not be limited to scheduling the Work around any time periods prohibiting work within creek limits, installing erosion control measures and employing appropriate BMPs for controlling erosion, monitoring, updating and modifying BMPs to meet the requirements for changing site conditions to comply with erosion control and creek protection, replanting creek banks to reestablish erosion resistance and bank stability.

1.11 PROJECT SITE MAINTENANCE

- A. Water Pollution Control. The intent of these requirements is to enforce federal, state, and other local agencies' regulations that prohibit storm water pollution at construction sites. Storm drains discharge directly to creeks and the Bay without treatment, and discharge of pollutants (i.e., any substance, material, or waste other than uncontaminated storm water) into the storm drain system is strictly prohibited.
- B. The term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, watercourses, creeks, lakes, and the San Francisco Bay.
- C. For the purpose of eliminating storm water pollution, the Contractor shall implement effective control measures at construction sites. There are several publications that provide guidance on selecting and implementing effective control measures known as Best Management Practices (BMPs). BMPs include schedules of activities, prohibition of specific practices, general good housekeeping practices, operational practices, pollution prevention practices, maintenance procedures and other management procedures to prevent the discharge of pollutants directly or indirectly to the storm drain system. BMPs also include the construction of some facilities that may be required to prevent, control, and abate storm water pollution. The reference publications are as follows:

1. California Storm Water Best Management Practice Handbook - Industrial/Commercial
2. California Storm Water Best Management Practice Handbook - Construction Activity

These handbooks may be purchased from Blue Print Service (BPS), 1700 Jefferson St, Oakland, CA 94612.

3. Manual of Standards for Erosion and Sediment Control Measures by the Association of Bay Area Governments (ABAG).
4. Heavy Equipment Operation, Fresh Concrete & Mortar Application, Painting & Application of Solvents & Adhesives, Roadwork & Paving Activities, General Construction & Site Supervision, Parking Lots and Finish the Pour Right

These brochures are available at the Engineering Division, 1947 Center Street, 4th Floor, Berkeley, CA 94704.

1.12 STORMWATER POLLUTION CONTROL

- A. Stormwater Pollution Control. The intent of these requirements is to comply with federal, state, and other local agencies' regulations that prohibit non-stormwater discharges to storm drain sewer systems, creeks and San Francisco Bay. Storm drain sewers discharge directly to creeks and the Bay without treatment, and discharge of pollutants (any substance, material, or waste other than rainfall derived stormwater) into the storm drain sewer system is strictly prohibited. Further, the Contractor is informed that Federally Endangered species have been identified in creeks within the City Limits. The storm drain sewer system, pollutants, and other relevant information are further defined in

Berkeley Municipal Code (BMC) Chapter 17.20 DISCHARGE OF NON-STORMWATER INTO CITY'S STORM DRAIN SYSTEM – REDUCTION OF STORMWATER POLLUTION, and the City's stormwater NPDES (National Pollutant Discharge Elimination System) Permit No. CAS612008. These documents are available upon request.

- B. Best Management Practices (BMP) and Source Control. The contractor shall use appropriate BMPs and source control techniques on the site(s) at all times, regardless of time of year or rainfall conditions, in order to prohibit the discharge of non-stormwater discharges into the storm drain sewer system, creeks, and Bay. BMPs shall be in conformance with the California Stormwater Quality Association's "Stormwater Best Management Practice Handbook", current edition.
- C. Water Pollution Control Plan (WPCP) and Coordinator. The Contractor shall prepare, submit for favorable review by the City, and implement a WPCP which shall contain at a minimum the items included in this section.
1. The Contractor shall designate an individual (to be approved by the City) available at all times of sufficient authority to halt work and implement BMPs and source control measures for the Contractor and all sub-contractors, suppliers, and other personnel that may be at the construction site(s), to prevent non-stormwater discharges from the construction site(s). This individual shall be the contact person for all matters of the project regarding non-stormwater discharges.
 2. The WPCP shall show the locations of all storm drains, storm drain pipes, creeks, creek culverts, points of entry (catch basins, inlets, outlets), and other features through which stormwater flows.
 3. The WPCP shall identify each point of entry and show how each entry point will be protected. The WPCP shall include a protocol for allowing drainage to flow properly during rainfall events WHILE STILL PREVENTING non-stormwater discharges from entering the storm drains, creeks, and Bay.
 4. The WPCP shall include descriptions and sketches of all BMPs, show locations and describe protocols for implementing and maintaining the following BMPs for but not limited to material storage, dewatering operations, bypass pumping, saw-cutting operations, pavement operations, concrete operations, grading and excavation operations, spill prevention and control, vehicle and equipment cleaning, vehicle and equipment operation and maintenance, litter control, dust control, pavement cleaning, and construction waste management.
 5. All employees, subcontractors, suppliers, and any others involved with the construction site(s) shall be trained in implementing, the importance of, and purpose of the WPCP.
 6. The WPCP shall be updated to meet changing stages of the construction site(s). Work shall not begin without the City completing its review and finding no exceptions taken on the WPCP and finding at City's sole discretion that the WPCP meets the intent and goals of the project.
 7. In addition, the Contractor shall observe the following guidelines:
 - a. Paving during wet weather:
 - i. No paving while it is raining.
 - ii. No paving of the top lift of asphalt concrete (AC) on any day that experiences $\frac{1}{4}$ " of rain in a twenty-four period.
 - iii. No paving of bottom lift if previous seventy-two (72) hour period experienced more than $\frac{1}{2}$ " of rain, unless directed by the City Engineer or his designee.
 - b. Store materials as required by BMPs.

- c. Cover inlets and manholes when applying asphalt, seal coat, tack coat, slurry seal, fog seal, etc., and while sawcutting, grooving, and grinding, etc.
- d. Place drip pans or absorbent materials under equipment when not in use.
- e. During wet weather, store paving equipment indoors or cover with tarp or other waterproof covering.
- f. Sweep site daily to prevent sand, gravel or excess asphalt from entering or being transported by rain into the storm drain system.
- g. Keep ample supplies of drip pans or absorbent materials on-site.
- h. If paving involves Portland cement concrete:
 - i. Do not wash out concrete trucks into storm drains, open ditches, streets, streams, etc. The Contractor shall prevent the discharge of pollutants from concrete operations by using measures to prevent run-on and run-off pollution, properly disposing of wastes, and by implementing the following BMP's:
 - a. Store all materials in waterproof containers or under cover away from drain inlets or drainage areas.
 - b. Avoid mixing excess amounts of Portland cement materials. Dispose of any excess materials properly.
 - c. Whenever possible, perform washout of concrete trucks off-site where discharge is controlled and not permitted to discharge to the storm drain system.
 - ii. For on-site washout:
 - a. Locate washout area at least fifty (50) feet from storm drains, open ditches or other water bodies, preferably in a dirt area.
 - b. Confine run-off from this area by constructing a temporary pit or bermed area large enough for the liquid and solid waste.
 - iii. Wash out concrete wastes into the temporary pit where the concrete can set, be broken up and then disposed of properly. If the volume of water is greater than what will allow concrete to set, allow the wash water to infiltrate and/or evaporate, if possible. Remove or vacuum the remaining silt and debris from the ponding or bermed area and dispose of it properly.
 - iv. Dispose of waste water from washing of exposed aggregate to dirt area. The dirt area shall be adequate to contain all the waste water and once the waste water has infiltrated, any remaining residue must be removed.
 - v. Collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in trash container.
- D. Training. Contractor is responsible for ensuring all personnel, laborers, sub-contractors, suppliers, and any other personnel that are involved with the Work are trained in the importance of preventing non-stormwater discharges. Each worker shall be trained or certified as being trained before being allowed to work. Before any work begins, the Contractor shall submit and certify under penalty of perjury a list of all workers who have been trained on the importance of pollution prevention, BMP and source control operation and maintenance, and recognize the authority of the City to stop the work in the event of a non-stormwater discharge. The training shall include as a minimum, review of the BMP and WPCP, and all BMPs (including BMP operation and maintenance) that are planned for the Work.
- E. Enforcement. The City has the authority through this contract and appropriate sections of the BMC to enforce any portions of this section. City enforcement may include but is not limited to: citations, orders to abate, bills for City cleanup costs and administration, civil suits, and criminal charges and enforcement. Enforcement action by the City does not void or suspend any enforcement actions by other agencies, and actions by the City and other agencies shall be cumulative.
- F. Submittals and Contract Time. Contractor is cautioned and advised to have appropriately trained staff with any applicable certifications prepare all submittals for Storm Water

Pollution Controls including the WPCP, and have appropriately trained staff available to meet with City staff to review the submittals. It is considered reasonable that the Contractor shall make a complete and acceptable submittal at least by the second submission. The City reserves the right to deduct monies from payments due Contractor to cover additional costs of City's and Architect/Engineer's review beyond the second submission. Illegible submittals will be rejected and returned to the Contractor.

- G. Payment. There shall be no separate pay item for complying with the provisions of this section, unless a separate pay item is provided in the bid schedule.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7329

CUTTING AND PATCHING

PART 1 - GENERAL**1.01 SUMMARY**

- A. Contractor shall be responsible for all cutting, fitting, and patching required to complete the work and to:
 - 1. Make its several parts fit together properly,
 - 2. Uncover portions of the work to provide for installation of ill-timed work,
 - 3. Remove and replace defective work,
 - 4. Remove and replace work not conforming to requirements of Contract Documents,
 - 5. Provide routine penetrations of nonstructural surfaces for installation of electrical conduit, plumbing, and ductwork,
 - 6. Remove Samples of installed work as specified for testing.

1.02 SUBMITTALS

- A. Submit a written request to the Architect/Engineer two weeks in advance of executing any cutting or alteration that affects the following and is not specifically indicated on the Drawings as part of the Scope of Work:
 - 1. Work of the City or any separate contractor,
 - 2. The structural value or integrity of any element of the completed building,
 - 3. The integrity or effectiveness of weather-exposed or moisture-resistant elements or systems,
 - 4. The efficiency, operational life, maintenance, and safety of operational elements,
 - 5. The visual qualities of sight-exposed elements.
- B. The request shall include:
 - 1. The necessity for cutting or alteration,
 - 2. The effect on the work of the City or any separate contractor or on the structural or weatherproof integrity of the building,
 - 3. Description of the Proposed Work:
 - a. The scope of cutting, patching, alteration, or excavation,
 - b. The trades who will execute the work,
 - c. The products proposed to be used,
 - d. The extent of refinishing to be done.
 - 4. Alternatives to cutting and patching,
 - 5. Cost proposal, when applicable,
 - 6. Written permission of any separate contractor whose work will be affected.
- C. Should conditions of the work or the schedule indicate a change of products from the original installation, submit a request for substitution per Section 00 6325 Substitution Request Form.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. Examine existing conditions of the Project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, examine the conditions affecting the installation of products or performance of the Work.
- C. Report unsatisfactory or questionable conditions to the Project Manager in writing. Do not proceed with the work until the Project Manager has provided further instructions.

3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work.
- B. Provide devices and methods to protect other portions of the Project from damage.
- C. Provide protection from the elements for that portion of the Project that may be exposed by cutting and patching work.

3.03 PERFORMANCE

- A. Execute cutting and demolition by methods that will prevent damage to other work and will provide proper surfaces to receive installation of repairs.
- B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
- C. All plumbing, mechanical, and electrical system elements shall be concealed, unless indicated otherwise.
- D. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.
- E. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- F. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish the entire unit.

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7413**PROJECT CLEANING****PART 1 - GENERAL****1.01 SUMMARY**

- A. Maintain Project Site, surrounding areas and public properties free from accumulations of waste, debris, and rubbish, caused by operations.
- B. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave Project Site clean and ready for occupancy.

1.02 GENERAL

- A. Conduct cleaning and disposal operation in accord with legal requirements.
 - 1. Do not burn or bury rubbish and waste materials on Project Site.
 - 2. Do not dispose of volatile wastes in storm or sanitary drains.
- B. Hazards control:
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.

Note: Care shall be taken that discharge of volatile or noxious exhaust shall be shielded from air intakes of hospital mechanical systems.

1.03 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.04 DUST CONTROL

- A. Clean interior spaces prior to start of finish painting, and continue cleaning as required until painting is completed.

1.05 DURING CONSTRUCTION

- A. Execute cleaning daily to ensure Project Site, City's premises, adjacent and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to control dust.
- C. At reasonable intervals during progress of Work, clean Project Site and public properties, and dispose of waste materials, debris and rubbish.
- D. Provide on Project Site dump containers for collection of waste materials, debris and rubbish. Hospital waste containers shall not be used for construction waste.
- E. Remove waste materials, debris and rubbish from City's premises and legally dispose of off City's property.
- F. Vacuum clean interior areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or

occupancy.

- G. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw materials.
- H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

1.06 FINAL CLEANING

- A. Employ experienced workers, or professional cleaners for final cleaning.
- B. In preparation for Substantial Completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of accessible concealed spaces.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed finished surfaces; polish surfaces so designated to shine finish.
- D. Repair, patch and touch up marred surfaces to specified finish, and to match adjacent surfaces.
- E. Broom clean paved surfaces.
- F. Keep Project clean until it is occupied by the City.
- G. Clean equipment and fixtures to a sanitary condition.
- H. Clean or replace, if required, filters of operating equipment.
- I. Clean Debris from roofs, gutters, downspouts and drainage systems.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7419**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging and recycling nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. Division 01 Section "Temporary Facilities and Controls" for environmental-protection measures during construction.

1.03 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS

- A. General: Develop waste management plan that results in end-of-Project rates for a minimum salvage/recycling percent by weight of total waste generated by the Work, as required by the Berkeley Municipal Code 19.37 Berkeley Green Code.
- B. Salvage/Recycle Goals: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible.
 - 1. Demolition Waste:
 - a. Asphaltic concrete paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.

- f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.
 - x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets.
 - aa. Plumbing fixtures.
 - bb. Piping.
 - cc. Supports and hangers.
 - dd. Valves.
 - ee. Sprinklers.
 - ff. Mechanical equipment.
 - gg. Refrigerants.
 - hh. Electrical conduit.
 - ii. Copper wiring.
 - jj. Lighting fixtures.
 - kk. Lamps.
 - ll. Ballasts.
 - mm. Electrical devices.
 - nn. Switchgear and panelboards.
 - oo. Transformers.
2. Construction Waste:
- a. Site-clearing waste.
 - b. Masonry and CMU.
 - c. Lumber.
 - d. Wood sheet materials.
 - e. Wood trim.
 - f. Metals.
 - g. Roofing.
 - h. Insulation.
 - i. Carpet and pad.
 - j. Gypsum board.
 - k. Piping.
 - l. Electrical conduit.
 - m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1. Paper.
 - 2. Cardboard.
 - 3. Boxes.
 - 4. Plastic sheet and film.

5. Polystyrene packaging.
6. Wood crates.
7. Plastic pails.

1.05 SUBMITTALS

- A. Waste Management Plan: Submit plan within **7** days of date established for the Notice to Proceed. The City uses Green Halo Tracking. Contractor shall be responsible for tracking construction waste through Green Halo at www.berkeley.wastetracking.com.
- B. See Evaluations for example of Waste Reduction Progress Reports in paragraph below.
- C. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit a copy of Green Halo reporting. Include the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons
 4. Quantity of waste salvaged, both estimated and actual in tons
 5. Quantity of waste recycled, both estimated and actual in tons
 6. Total quantity of waste recovered (salvaged plus recycled) in tons
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- D. Waste Reduction Calculations: Before request for Substantial Completion, submit **3** copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- E. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- F. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- G. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.06 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Green Building Professional. Waste management coordinator may also serve as Green Building coordinator.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.07 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged,

recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Construction Manager. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 1. Distribute waste management plan to all relevant sub-contractor within 3 days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 01 Section "Temporary Facilities and Temporary Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Owner's Use:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area.
 - 5. Protect items from damage during transport and storage.
- C. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.03 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following

The City of Berkeley Transfer Station
1201 Second Streets, Berkeley, CA
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.04 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 - 1. Clean and stack undamaged, whole masonry units on wood pallets.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
 - 1. Treated Wood Waste: Treated wood waste is required to be managed, stored, transported, and disposed of as hazardous waste per California State regulations. Treated wood waste is required to be transported and disposed of at a Class I hazardous waste landfill by a Hazardous Waste contractor.
- E. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- H. Plumbing Fixtures: Separate by type and size.
- I. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- J. Lighting Fixtures: Separate lamps by type and protect from breakage.
- K. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- L. Conduit: Reduce conduit to straight lengths and store by type and size.

3.05 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees.
- C. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - 3. Treated Wood Waste: Treated wood waste is required to be managed, stored, transported, and disposed of as hazardous waste per California State regulations. Treated wood waste is required to be transported and disposed of at a Class I hazardous waste landfill by a Hazardous Waste contractor.
- D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.06 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7700

CONTRACT CLOSEOUT

PART 1 - GENERAL**1.01 SUMMARY**

A. Section describes requirements and procedures for:

1. Project cleaning.
2. Testing of equipment and systems
3. Substantial Completion
4. Final Completion
5. Close Out
6. Warranties

1.02 SUBSTANTIAL COMPLETION

A. Removal of Temporary Construction Facilities and Project Cleaning.

1. Prior to Substantial Completion inspection: remove temporary materials, equipment, services, and construction; clean all areas affected by the Work; clean and repair damage caused by installation or use of temporary facilities; restore permanent facilities used during construction to specified condition.

B. Equipment and Systems.

1. Prior to Substantial Completion, Contractor shall start up, run for periods prescribed by City, operate, adjust and balance all manufactured equipment and Project systems, including but not limited to, mechanical, electrical, safety, fire, and controls.
2. Demonstrate that such equipment and systems conform to contract standards and manufacturer's guarantees. Where applicable, use testing protocols specified, and if the contract is silent, then consistent with manufacturer's recommendations and industry standards.

C. Procedure for Substantial Completion

1. When Contractor considers Work or designated portion of the Work as Substantially Complete, submit written notice to City, with list of items remaining to be completed or corrected and explanation of why such items do not prevent City's beneficial use and occupancy of the Work for its intended purposes. Within reasonable time, City will inspect to determine status of completion.
2. Should City determine that Work is not Substantially Complete, City will promptly notify Contractor in writing, listing all defects and omissions. Contractor shall remedy deficiencies and send a second written notice of Substantial Completion. City will reinspect the Work. If deficiencies previously noted are not corrected on reinspection, then pay the cost of the reinspection.
3. When City concurs that Work is Substantially Complete, City will issue a written notice or certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified by City.
4. Manufactured units, equipment and systems that require startup must have been

started up and before a notice or certificate of Substantial Completion will be issued.

5. A punch list examination will be performed upon Substantial Completion. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, Contractor will reimburse City for costs associated with these visits.

1.03 FINAL COMPLETION

A. Requirements

1. Final Completion occurs when Work meets requirements for City's Final Acceptance.

B. Procedure

1. When Contractor considers Work is Finally Complete, submit written certification that:
 - a. Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
 - b. Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of City, and are operative.
 - c. Project Record Documents are completed and turned over to City, and Work is complete and ready for final inspection.
2. In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
3. Should City determine that Work is incomplete or Defective, City promptly will so notify Contractor, in writing, listing the incomplete or Defective items. Contractor shall promptly remedy the deficiencies and notify the City when it is ready for reinspection.

C. Final Adjustments of Accounts:

1. Submit a final statement of accounting to City, showing all adjustments to the Contract Sum and complete and execute Document 00 6530 (Agreement and Release of Claims).
2. If so required, City shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

D. Warranties

1. Execute Contractor's Submittals and assemble warranty documents, and Installation, Operation, and Maintenance Manuals, executed or supplied by Subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in 8½ inches by 11 inches three-ring binder with durable plastic cover, appropriately separated and organized. Assemble in Specification Section order.
2. Submit material prior to final Application for Payment. For equipment put into use with City's permission during construction, submit within 14 calendar days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated Submittal within 14 calendar days after acceptance, listing date of acceptance as start of warranty period.
3. Warranty Forms: Submit drafts to Owner for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents. Warranty shall be countersigned by manufacturers. Where specified, warranty shall be countersigned by Subcontractors and installers.

4. Rejection of Warranties: Owner reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.
5. Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one year minimum from date of Final Completion of entire Work except where:
 - a. Detailed Specifications for certain materials, equipment or systems require longer warranty periods.
 - b. Materials, equipment or systems are put into beneficial use of City prior to Final Completion as agreed to in writing by City.

E. Warranty of Title:

1. No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to City free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of City.
- F. Turn-In. Contract Documents will not be closed out and final payment will not be made until all keys issued to Contractor during prosecution of Work and letters from property owners, pursuant to Contract Documents, are turned in to City.
- G. Release of Claims. Contract Documents will not be closed out and final payment will not be due or made until Document 00 6530 (Agreement and Release of Claims) is completed and executed by Contractor and City.
- H. Fire Inspection Coordination. Coordinate fire inspection and secure sufficient notice to City to permit convenient scheduling (if applicable).
- I. Building Inspection Coordination. Coordinate with City a final inspection for the purpose of obtaining an occupancy certificate (if applicable).

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7800**CLOSEOUT SUBMITTALS****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section specifies administrative and procedural requirements for Project Record Documents.
- B. Project Record Documents required include:
 - 1. Marked-up copies of Contract Drawings
 - 2. Marked-up copies of Shop Drawings
 - 3. Newly prepared Drawings
 - 4. Marked-up copies of Specifications, Addenda and Change Orders
 - 5. Marked-up Project Data submittals
 - 6. Record Samples
 - 7. Field records for variable and concealed conditions
 - 8. Record information on Work that is recorded only schematically
- C. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 1 through 33.
- D. General Project closeout requirements are included in Section 01 7700, "Contract Closeout."
- E. Maintenance of Documents and Samples:
 - 1. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
 - 2. Do not permit Project Record Documents to be used for construction purposes.
 - 3. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
 - 4. Make documents and samples available at all times for inspection by Architect and Project Manager.
- F. City will provide one set of sepias and one blueline set of the construction drawings and one project manual for the Contractor's use and copying during construction.

1.02 PROJECT RECORD DRAWINGS

- A. Mark-up Procedure: During the construction period, maintain a set of blueline or blackline prints of Contract Drawings and Shop Drawings for Project Record Document purposes. Label each document (on first sheet or page) "PROJECT RECORD" in 2 in. high printed letters. Keep record documents current. Note: A reference by number to a Change Order, RFI, RFQ, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.
 - 1. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to

information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

- a. Dimensional changes to the Drawings
 - b. Revisions to details shown on the Drawings
 - c. Depths of various elements of foundation in relation to main floor level or survey datum.
 - d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - f. Establish locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, and similar items.
 - g. Provide actual numbering of each electrical circuit.
 - h. Field changes of dimension and detail.
 - i. Revisions to routing of piping and conduits
 - j. Revisions to electrical circuitry
 - k. Actual equipment locations
 - l. Duct size and routing
 - m. Changes made by Change Order
 - n. Details not on original Contract Drawings
2. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 3. Mark Project Record Drawing sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.
 4. Mark important additional information which was either shown schematically or omitted from original Drawings.
 5. Note construction change directive numbers; alternate numbers; Change Order numbers and similar identification.
 6. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
- B. Preparation of Transparencies: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with the Project Manager]. When authorized, prepare a full set of correct transparencies of Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each Drawing.
 2. Refer instances of uncertainty to the Project Manager for resolution.
 3. Review of Transparencies: Before copying and distributing, submit corrected

transparencies and the original marked-up prints to the Project Manager and Architect/Engineer for review.

- a. Transparencies and the original marked-up prints will be returned to the Contractor for organizing into sets, printing, binding, and final submittal.
4. Copies and Distribution: After completing the preparation of transparency Project Record Drawings, print three blue-line or black-line prints of each Drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets.
 - a. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
 - b. Organize Project Record Drawings transparencies into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
- C. Distribution of Marked up Drawings and Transparencies
 1. Submit the marked-up Project Record Drawings set, pdfs, transparencies, and five copy sets to the Project Manager for City's records.
- D. Shop Drawings and Samples: Maintain as record documents; legibly annotate Shop Drawings and Samples to record changes made after review.
- E. In addition to requirements of this Section, comply with supplemental requirements of Divisions 21 and 28 and Division 33.
 1. Divisions 21 through 28 and Division 33 of the specifications require the preparation of large scale, detailed Layout Drawings of the work of those divisions. These Layout Drawings are not shop drawings as defined by the General Conditions, but together with shop drawing or Layout Drawings of all other affected sections are used check, coordinate and integrate the work of the various sections
 2. Include these Layout Drawings as part of the As Built Documents.
- F. Delete Architect/Engineer title block and seal from documents.
- G. As-Built Documents are subject to review and acceptance by the City and Architect/Engineer.
- H. Submit documents to Project Manager with final Application for payment.

1.03 PROJECT RECORD SPECIFICATIONS

- A. During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
 1. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, change order work, and information on concealed installation that would be difficult to identify or measure and record later.
 - a. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.

- c. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.
2. Upon completion of mark-up, submit Project Record Specifications to the Project Manager for City's records.

1.04 PROJECT RECORD PRODUCT DATA

- A. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
 1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
 4. Upon completion of mark-up, submit a complete set of Project Record Product Data to the Project Manager for City's records.
 5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
 6. Each prime Contractor is responsible for mark-up and submittal of record Project Record Product Data for its own Work.
- B. Material, Equipment and Finish Data
 1. Provide data for primary materials, equipment and finishes as required under each specification section.
 2. Submit two sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.
 3. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:
 - a. Trade names.
 - b. Model or type numbers.
 - c. Assembly diagrams.
 - d. Operating instructions.
 - e. Cleaning instructions.
 - f. Maintenance instructions.
 - g. Recommended spare parts.
 - h. Product data.

1.05 MISCELLANEOUS PROJECT RECORD SUBMITTALS

- A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Project Manager for City's records. Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

1. Field records on excavations and foundations
2. Field records on underground construction and similar work
3. Survey showing locations and elevations of underground lines
4. Invert elevations of drainage piping
5. Surveys establishing building lines and levels
6. Authorized measurements utilizing unit prices or allowances
7. Records of plant treatment
8. Ambient and substrate condition tests
9. Certifications received in lieu of labels on bulk products
10. Batch mixing and bulk delivery records
11. Testing and qualification of tradespersons
12. Documented qualification of installation firms
13. Load and performance testing
14. Inspections and certifications by governing authorities
15. Leakage and water-penetration tests
16. Fire resistance and flame spread test results
17. Final inspection and correction procedures

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 RECORDING

- A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. City may review Project Record Documents prior to each progress payment to see that the required information is being properly and faithfully recorded to assure compliance with this requirement. If Contractor has not complied with this requirement, the progress payment will be withheld until the Record Documents have been brought up to date.

3.02 SUBMITTAL

- A. At completion of Project, deliver Record Documents to Project Manager.
- B. Accompany submittal with transmittal letter containing:
 1. Date
 2. Project title and number
 3. Contractor's name and address
 4. Number and title of each record documents
 5. Certification that each document as submitted is complete and accurate, and signature of Contractor, or his authorized representative.

END OF SECTION

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SECTION 01 73 29 - NTU CUTTING, PATCHING AND ALTERATION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work..
- C. Cutting and patching.
- D. Cleaning and protection.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 73 00 - Execution Requirements: General requirements for protection of installed work.
- C. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- D. Section 01 77 00 - Closeout Procedures: General requirements for demonstration and training.
- E. Section 01 91 10 - General Commissioning Requirements: Contractor's responsibilities in regard to commissioning.
- F. Section 02 41 13 - Selective Demolition: Demolition of portions of existing building as indicated.
- G. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

1.04 SUBMITTALS

- A. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.

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3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.
6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
 - f. Written permission of affected separate Contractor.
 - g. Date and time work will be executed.

1.05 PROJECT CONDITIONS

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
- D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. See Section 01 11 00 - NTU Summary of Work for occupancy-related requirements.

- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements , with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner 's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

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- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions.

- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.

2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
 2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
 3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

3.05 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.

8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.
- J. Patching:
 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 2. Match color, texture, and appearance.
 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

- A. See Section 01 73 00 - Execution Requirements and technical Sections for temporary protective covering materials.
- B. Protect installed work from damage by construction operations.

- C. Provide special protection where specified in individual specification sections.
- D. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- E. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- F. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- G. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- H. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 SYSTEM STARTUP

- A. Coordinate with requirements of Section 01 91 10 - General Commissioning Requirements.
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Notify Architect and Owner seven days prior to start-up of each item.
- D. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- E. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- F. Verify that wiring and support components for equipment are complete and tested.
- G. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

- A. See Section 01 77 00 - Closeout Procedures
- B. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

END OF SECTION

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SECTION 02 41 13 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Selective demolition of building elements as indicated.
2. Pollutant control measures.
3. Protection of existing building finishes during demolition and construction, including, but not limited to, wood paneling and trim.
4. Protection of fixed casework, audience seating, lockers, and similar elements not indicated to be removed.
5. Construction waste reduction, disposal, and recycling including required documentation for Construction Waste Management Plan and its implementation.

B. Related Sections

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Section 01 11 00 - NTU Summary of Work: For items to be salvaged.
3. Section 01 74 19 - NTU Construction Waste Management and Disposal: For procedures and documentation associated with demolition waste.
4. Division 21 - Fire Suppression: For demolition requirements as specified and as indicated on the Drawings.
5. Division 22 - Plumbing: For demolition requirements as specified and as indicated on the Drawings.
6. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC): For demolition requirements as specified and as indicated on the Drawings.
7. Division 26 - Electrical: For demolition requirements as specified and as indicated on the Drawings.
8. Division 27 - Communications: For demolition requirements as specified and indicated on the Drawings.
9. Division 28 - Electronic Safety and Security: For demolition requirements as specified and as indicated on the Drawings.

1.02 REFERENCES

- A. ANSI/ASSE - American National Standards Institute/American Society of Safety Engineers**

1. A10.6 - Safety Requirements for Demolition Operations.
- B. EPA - Environmental Protection Agency
- C. NFPA - National Fire Protection Association
1. 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.03 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
 1. Storage or sale of removed items or materials on-site is not permitted.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver them to the Owner's designated storage area.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, at the Contractor's option and at no additional cost, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
- E. Materials Ownership: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.04 SUBMITTALS

- A. CALGreen submittals: Refer to Section 01 74 19 - NTU Construction Waste Management and Disposal for planning and documentation of construction waste resulting from demolition activities.
 1. Construction Waste Management Plan: Prepare and submit in accordance with CALGreen requirements.
 2. Construction Waste Management Worksheets: Prepare and submit in accordance with CALGreen requirements.
 3. Construction Waste Management Acknowledgment: Prepare and submit in accordance with CALGreen requirements.
- B. Schedule of selective demolition activities indicating the following:
 1. Interruption of utility services and security devices.

2. Coordination for shutoff, capping, and continuation of utility services and security devices.
 3. Locations of temporary barricades, partitions, and means of egress.
 4. Above items shall be shown on Preliminary schedule, Final Schedule, and 3-week look aheads. Final dates of shutdowns are required no less than 10 days prior to activity in a request to Program Manager in writing.
- C. Construction Logistics Plan indicating the following:
1. Barricades and enclosures.
 2. Laydown and staging area.
- D. Inventory of items to be removed and salvaged.
- E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
1. Wall finishes, ceilings, soffits, and trim not indicated to be removed.
- F. Record Drawings at Project Closeout: Identify and accurately locate capped utilities and other subsurface structural, electrical, plumbing, mechanical and security devices.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements
1. Comply with governing EPA notification regulations before beginning selective demolition.
 2. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- C. Predemolition Conference: Conduct conference at Project site.

1.06 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner as far as practical.
- B. Portions of site immediately adjacent to selective demolition area will be occupied. Conduct selective demolition so Owner's operations will not be disrupted.

1.07 WARRANTIES

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

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped where indicated.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
 - 1. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated plumbing, mechanical, electrical, security, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
- E. Survey the condition of the buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structures during selective demolition.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized by the Owner. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to governing authorities.
 - a. Provide not less than 10 calendar days' notice to the Owner if shutdown of service is required during changeover.
- B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving portions of the buildings or sitework to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with the Owner.
 - 2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.03 PREPARATION

- A. Conduct demolition operations and remove debris to ensure minimum interference with streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction.
- B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
 - 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Owner.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 3. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces to ensure that no water leakage or damage occurs to structure or interior areas.
 - 4. Protect walls, ceilings, floors, fixed audience seating, and other existing finish work that are to remain and are exposed during selective demolition and construction operations.
 - a. Exercise care to protect existing wood paneling and ceilings to remain.
 - 5. Cover and protect furniture, furnishings, and equipment that have not been removed.
- C. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
 - 1. Construct dustproof partitions of not less than nominal 4-inch studs and 1/2-inch fire retardant plywood on the demolition side; seal joints and perimeter.
 - 2. Non-plastic sheet materials shall be used to further mitigate dust and shall not trap moisture; seal to prevent dust penetration.
- D. Provide and maintain interior and exterior bracing or structural support to preserve stability and prevent movement, settlement, or collapse of portions of building to be selectively demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.04 POLLUTANT CONTROLS

- A. CALGreen Requirements: Refer to Section 01 81 13 - NTU Sustainable Design Requirements for requirements for temporary ventilation and pollutant control.

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1. Comply with CALGreen 5.504.3 regarding covering of duct openings and protection of mechanical equipment during construction.
 2. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, temporary or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.
 3. Comply with SMACNA Indoor Air Quality (IAQ) Guideline for Occupied Buildings under Construction if permanent heating, cooling, and ventilating systems are in use during selective demolition operations.
- B. Use temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
- D. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to the condition existing before start of selective demolition.

3.05 SELECTIVE DEMOLITION

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

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- B. Demolish concrete in small sections. Cut concrete at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

3.06 MANAGEMENT OF DEMOLISHED MATERIALS

- A. Recycle and/or salvage for reuse non-hazardous demolition waste in accordance with requirements of Section 01 74 19 - NTU Construction Waste Management and Disposal. Remove from site all materials not to be reused on site.
- B. Store items to be salvaged and reinstalled in a secure and protected location until ready for reinstallation.
- C. Burning: Do not burn demolished materials.
- D. Refer to the Division 01 for procedures to follow when materials containing asbestos and lead are encountered.

3.07 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
- B. Return adjacent areas to condition existing before selective demolition operations began.
- C. Sweep the building broom clean on completion of selective demolition operation.

END OF SECTION

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SECTION 07 92 00 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.
- D. Field quality control

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 10 22 13 – Wire Mesh Partitions.
- C. Section 08 71 00 - Door Hardware: Setting exterior door thresholds in sealant.
- D. Section 09 90 00 - Tiling: Painting and Coatings

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015 (Reapproved 2022).
- B. ASTM C834 - Standard Specification for Latex Sealants 2017.
- C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2022.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.
- G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.
- H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2019 (Reapproved 2020).
- I. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).
- J. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

- K. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2017).

1.04 ACTION SUBMITTALS

- A. CALGreen Submittals: Provide product data to demonstrate that adhesives, sealants, and caulks, including all system components such as primers, adhesives, and coatings meet the requirements of the following standards:
1. TABLE 5.504.4.1 - ADHESIVE VOC LIMIT; TABLE 5.504.4.2 - SEALANT VOC LIMIT as listed in Section 01 81 13 - Sustainable Design Requirements.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 2. List of backing materials approved for use with the specific product.
 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 4. Substrates the product should not be used on.
 5. Substrates for which use of primer is required.
 6. Substrates for which laboratory adhesion and/or compatibility testing is required.
 7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 8. Sample product warranty.
 9. Certification by manufacturer indicating that product complies with specification requirements.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Drawings or catalog illustrations in sufficient detail to show installation and interface of the work of this Section with the work of adjacent trades.
- E. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

1.05 INFORMATIONAL SUBMITTALS

- A. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds (VOCs).

- B. Submit manufacturer's letter of certification that products comply with specified requirements and are suitable for the uses intended.
- C. Product Test Reports:
 - 1. Certified test results of elastomeric sealants showing compliance with specified requirements. Include results of aged performances including hardness, stain-resistance, adhesion and cohesion under cyclic movement, low temperature flexibility, modulus of elasticity at 100-percent strain, effects of heat and aging, and effects of accelerated weathering.
 - 2. Preconstruction field test results indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.
- D. Installer Qualifications:
 - 1. Written documentation of applicator's qualifications, including reference projects of similar scope and complexity, with current phone contacts of architects and owners for verification.

1.06 CLOSEOUT SUBMITTALS

- A. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation; see Division 1: Sustainable Design Requirements.
- B. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.
- C. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.
- D. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.

1.07 QUALITY ASSURANCE

- A. Single Source Responsibility for Joint Sealants: Obtain joint sealants of each type from a single manufacturer.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company shall be approved by the sealant manufacturer and shall demonstrate at least three years of documented experience in installing materials of types specified.

1. Provide list of at least three projects of similar scope and complexity.
 2. Installer shall designate a single individual as project foreman who shall be on site at all times during installation.
- D. Pre-Installation Conference: Prior to scheduled commencement of the sealant installation and associated work, conduct a meeting at the project site with the installer, architect/consultant, owner, manufacturer's representative and any other persons directly involved with the performance of the Work. The Installer shall record conference discussions and to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to the Work.
- E. Preinstallation Field Adhesion Test Plan: For jobsite field samples prior to general installation, conduct field-tests for adhesion of each type of joint sealant and joint substrates using proposed joint preparation methods recommended by manufacturer.,
1. Include destructive field adhesion testing of one sample of each combination of sealant type and substrate.
 2. Field Adhesion Test Method: Use manufacturer's standard field adhesion test methods and methods proposed for joint preparation to verify proper priming and joint preparation techniques required to obtain optimum adhesion of joint sealants to joint substrate. Evaluate and report results of field adhesion testing.
 3. Propose locations for field-test joints where inconspicuous and obtain Architect's approval prior to proceeding.
 4. Field Samples: Joints installed during pre-construction field adhesion testing that are accepted by Architect shall be retained as standard of acceptability and incorporated into Work of that area during general installation. At least one such standard of minimum 5 feet in length shall be established for each type of sealant and substrate.
 5. Destructive testing is not required for interior acrylic latex sealants.
- F. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
1. Record results on Field Quality Control Log.
 2. Repair failed portions of joints.
- G. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
1. Sample: At least 18 inches long.
 2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by

two; then multiply 1 inch by that percentage; if adhesion failure occurs before the 1-inch mark is that distance from the substrate, the test has failed.

3. If either adhesive or cohesive failure occurs before minimum elongation, take necessary measures to correct conditions and retest; record each modification to products or installation procedures.
4. Record results on Field Quality Control Log.
5. Repair failed portions of joints.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's unopened containers with all labels intact and legible at time of use. Handle and store materials in accordance with manufacturer's recommendations with proper precautions to ensure fitness of material when installed.

1.09 WARRANTY

- A. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.
- B. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
- D. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- E. Exterior Sealants: Furnish a written warranty against leaks or other defects of materials and workmanship. Defects include but are not limited to changes in the structural, physical or chemical properties of the sealant materials that impair function or require abnormal maintenance, changes in surface finish, color or texture, failure in adhesion, weather resistance or durability, failure to prevent entry of water, or failure to comply with specified requirements.
 1. This warranty shall not cover formation of cracks or defects in substrate materials adjacent to the seal, joint movement in excess of movement rating of sealant, or physical damage caused by others.
 2. Repair or replace defective materials and workmanship during warranty period without expense to Owner, including removal and replacement of other items as required.

3. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.
 4. Warranty Period: Ten years from date of Substantial Completion.
- F. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.01 SUSTAINABLE MATERIAL REQUIREMENTS, GENERAL

- A. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene, and trichloroethylene), except for aerosol products as specified in subsection 2, below.
- B. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.

2.02 JOINT SEALANT APPLICATIONS

- A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.

- d. Openings below ledge angles in masonry.
- e. Other joints indicated below.
- 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
 - c. Other joints indicated below.
- 3. Do not seal the following types of joints:
 - a. Intentional weep holes in masonry.
 - b. Joints indicated to be treated with manufactured expansion joint cover, or some other type of sealing device.
 - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - d. Joints where installation of sealant is specified in another section.
 - e. Joints between suspended panel ceilings/grid and walls.

2.03 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 81 13 - Sustainable Design Requirements.
- B. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 ELASTOMERIC JOINT SEALANTS

- A. Sealant Type A: Low-modulus, non-sag sealant; comply with ASTM C920, Type S or M, Grade NS, Class 25, Class 35, Class +50/-50, Class +100/-50 as applicable.
 - 1. Applications: For **exterior** joints in **vertical surfaces and non-traffic horizontal surfaces** including, but not limited to, the following:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Joints between architectural pre-cast concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Butt joints between metal panels.

- e. Joints between marble and granite.
 - f. Joints between different materials listed above.
 - g. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
 - h. Control and expansion joints in ceiling and overhead surfaces.
2. Single-Component Urethanes and Silyl-Terminated Polymers:
 - a. Sikaflex-1a (13)
 - b. Sikaflex Textured Sealant (40)
 - c. Sikaflex-15 LM (33)
 - d. SikaHyflex 150 LM (18)
 3. Multiple-Component Urethanes and Silyl-Terminated Polymers:
 - a. Sikaflex-2c NS EZ mix (63)
 4. Single-Component Silicones:
 - a. Sikasil WS 290 (29)
 - b. Sikasil WS 295 (37)
 - c. Sika Silbridge 300 (?)
 - d. Sikasil 728NS (21)
 - e. Sikasil N Plus (37)
- B. Sealant Type B: Low-modulus, non-sag sealant; comply with ASTM C920, Type S or M, Grade NS, Class 25, Class 35, Class +50/-50, Class +100/-50 as applicable.
1. Applications: For **interior** joints in **vertical surfaces and non-traffic horizontal surfaces** including, but not limited to, the following:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints on exposed interior surfaces of exterior openings.
 - c. Joints on pre-cast beams and planks.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, louvers, elevator entrances and similar openings.
 - e. Trim or finish joints subject to movement.
 2. Single-Component Urethanes and Silyl-Terminated Polymers:

- a. Sikaflex-1a (13)
 - b. Sikaflex Textured Sealant (40)
 - c. Sikaflex-15 LM (33)
 - d. SikaHyflex 150LM (18)
- 3. Multiple-Component Urethanes and Silyl-Terminated Polymers:
 - a. Sikaflex-2c NS EZ mix (63)
- 4. Single-Component Silicones:
 - a. Sikasil WS-290 (29)
 - b. Sikasil WS-295 (37)
 - c. Sika Silbridge 300 (?)
- C. Sealant Type C: Polyurethane complying with ASTM C920, Type S or M, Grade P, Class 25 or silicone sealant complying with ASTM C920, Type S or M, Grade P or NS, Class 100/50 as applicable.
 - 1. Applications: For **exterior and interior** joints in **horizontal and sloped traffic surfaces** including, but not limited to, the following:
 - a. Control expansion and isolation joints in cast-in-place concrete.
 - b. Control expansion and isolation joints in structural pre-cast concrete units.
 - c. Joints between architectural pre-cast concrete paving units.
 - d. Tile control and expansion joints.
 - e. Joints between different materials listed above.
 - 2. Single Component Urethane.
 - a. Sikaflex-1c SL (40)
 - 3. Multiple-Component Urethane.
 - a. Sikaflex-2c SL (38)
 - 4. Single Component Silicone:
 - a. Sikasil 728 SL (29)
 - 5. Multiple-Component Silicone:
 - a. Sikasil 728 RCS (30)

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- D. Sealant Type D: Single-component or multi-component polyurethane sealant certified by National Sanitation Foundation as conforming to the requirements of NSF Standard 61- Drinking Water System Components-Health Effects; comply with ASTM C920, Type S or M, Grade P or NS, Class 25; select color from the NSF listing.
 - 1. Applications: For **exterior and interior** joints in vertical and horizontal surfaces of **potable water storage areas**.
 - 2. Single Component Urethane:
 - a. Sikaflex-1a (13)
 - 3. Multiple-Component Urethane:
 - a. Sikaflex-2c NS EZ mix (63)

- E. Sealant Type E: Single-component or multi-component polyurethane sealant complying United States Department of Agriculture (USDA) guidelines for incidental food contact with the cured sealant; comply with ASTM C920, Type S or M, Grade P or NS, Class 25; select color from listing of those approved.
 - 1. Applications: For **interior joints** in **vertical and horizontal surfaces where incidental food contact** may occur.
 - 2. Single Component Urethane:
 - a. Sikaflex-1a (13)
 - 3. Multiple-Component Urethane:
 - a. Sikaflex-2c NS EZ Mix (63)

- F. Sealant Type F: Single-component urethanes and silyl-terminated polymers.
 - 1. Applications: For interior or exterior joints in vertical surfaces between laps in fabrications of sheet metal.
 - 2. Single Component Urethane; Sikaflex-1a, Sikaflex Textured Sealant, SikaHyflex 150LM.
 - a. Sikaflex-1a (13)
 - b. Sikaflex Textured Sealant (63)
 - c. SikaHyflex 150LM (18)

- G. Sealant Type G: Single-component urethanes and silicones.
 - 1. Applications: For **exterior vertical joints under metal thresholds and saddles or as bedding sealant for sheet metal flashing and frames of metal or wood**.
 - 2. Single Component Urethane:

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- a. Sikaflex-1a (13)
- b. Sikaflex Textured Sealant (40)
- 3. Single Component Silicone:
 - a. Sikasil WS 295 (37)

2.05 NONSAG JOINT SEALANTS -

- A. Type H - Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 15 percent, minimum.
 - 2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
 - 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 - 4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - 5. Color: Match adjacent finished surfaces.
 - 6. Color: To be selected by Architect from manufacturer's standard range.
 - 7. Cure Type: Single-component, neutral moisture curing.
 - 8. Service Temperature Range: Minus 20 to 180 degrees F.
 - 9. Products:
 - a. Dow; DOWSIL 756 SMS Building Sealant: www.dow.com/#sle. (43.8 g/L)
 - b. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle. (38.5 g/L)
 - c. Dow; DOWSIL 791 Silicone Weatherproofing Sealant: www.dow.com/#sle. (30 g/L)
 - d. Dow; DOWSIL 795 Silicone Building Sealant: www.dow.com/#sle. (30 g/L)
 - e. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle. (98; GG)
 - f. Pecora Corporation; Pecora 864 NST (Non-Staining Technology): www.pecora.com/#sle. (98; GG)
 - g. Sika Corporation; Sikasil WS-290; www.usa.sika.com/#sle. (29)
 - h. Sika Corporation; Sikasil WS-295: www.usa.sika.com/#sle. (37)
 - i. Sika Corporation; Sikasil 728NS: www.usa.sika.com/#sle. (21)

- j. Tremco Commercial Sealants & Waterproofing; Spectrem 1:
www.tremcosealants.com/#sle. (1, GG)
 - k. Tremco Commercial Sealants & Waterproofing; Spectrem 2:
www.tremcosealants.com/#sle. (42, GG)
 - l. Tremco Commercial Sealants & Waterproofing; Spectrem 3:
www.tremcosealants.com/#sle. (18, GG)
 - m. Tremco Commercial Sealants & Waterproofing; Spectrem 4-TS:
www.tremcosealants.com/#sle. (18, GG)
 - n. Tremco Commercial Sealants & Waterproofing; Tremsil 200:
www.tremcosealants.com/#sle. (1, GG)
 - o. Tremco Commercial Sealants & Waterproofing; Tremsil 400:
www.tremcosealants.com/#sle. (42 g/L)
- B. Type J - Silicone Sealant: ASTM C920, Grade NS, Use T; single component, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
- 1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
 - 2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's standard range.
 - 4. Products:
 - a. Dow; DOWSIL NS Parking Structure Sealant: www.dow.com/#sle. (37 g/L)
 - b. Dow; DOWSIL 888 Silicone Joint Sealant: www.dow.com/#sle. (26 g/L)
 - c. Pecora Corporation; Pecora PCS: www.pecora.com/#sle. (82, GG)
 - d. Pecora Corporation; Pecora 301 NS (Non-Sag): www.pecora.com/#sle. (50, GG)
 - e. Tremco Commercial Sealants & Waterproofing; Spectrem 800:
www.tremcosealants.com/#sle. (1, GG)
- C. Type K - Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
- 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: Match adjacent finished surfaces.
 - 4. Color: To be selected by Architect from manufacturer's standard range.

5. Cure Type: Single component, neutral moisture curing.
6. Service Temperature Range: Minus 65 to 180 degrees F.
7. Products:
 - a. Dow; DOWSIL 999-A Building and Glazing Sealant: www.dow.com/#sle. (40 g/L)
 - b. Dow; DOWSIL 758 Silicone Weather Barrier Sealant: www.dow.com/#sle. (22.2 g/L)
 - c. Franklin International, Inc; Titebond 100% Silicone Sealant: www.titebond.com/#sle. (50 g/L)
 - d. Pecora Corporation; Pecora 860: www.pecora.com/#sle. (25, GG)
 - e. Pecora Corporation; Pecora 890FTS (Field Tintable Smooth): www.pecora.com/#sle. (98, GG)
 - f. Sika Corporation; Sikasil GP: www.usa.sika.com/#sle. (29)
 - g. Sika Corporation; Sikasil WS-295 www.usa.sika.com/#sle. (37)
 - h. Sika Corporation; Sikasil N-Plus US: www.usa.sika.com/#sle. (37)
 - i. Sika Corporation; Sikasil 728NS: www.usa.sika.com/#sle. (21)
- D. Type L - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
 1. Color: White.
 2. Products:
 - a. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle. (82, GG)
 - b. Sika Corporation; Sikasil GP: www.usa.sika.com/#sle. (29)
- E. Type M - Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
 1. Movement Capability: Plus and minus 35 percent, minimum.
 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 3. Color: Match adjacent finished surfaces.
 4. Service Temperature Range: Minus 40 to 180 degrees F.

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5. Products:

- a. Sika Corporation; Sikaflex-1a: www.usa.sika.com/#sle. (13)
- b. Sika Corporation; Sikaflex-2c NS: www.usa.sika.com/#sle. (63)

F. Type N - Nonsag Traffic-Grade Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; T, M and O single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.

- 1. Movement Capability: Plus and minus 25 percent, minimum.
- 2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
- 3. Color: Match adjacent finished surfaces.
- 4. Service Temperature Range: Minus 40 to 180 degrees F.
- 5. Products:
 - a. Pecora Corporation; Urexpan NR-200 (0)
 - b. Sika, Inc.; Sikaflex-2c SL (38)
 - c. Tremco Incorporated, THC 900/901. (94)

2.06 NON-SAG ACRYLIC SEALANTS

A. Type O - Acrylic-Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.

- 1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
- 2. Hardness Range: 15 to 40, Shore A, when tested in accordance with ASTM C661.
- 3. Color: White.
- 4. Service Temperature Range: Minus 40 to 180 degrees F.
- 5. Products:
 - a. Sherwin-Williams Company; Shermax Urethanized Elastomeric Sealant: www.sherwin-williams.com/#sle. (1)
 - b. Top Gun, a brand of PPG Architectural Coatings; Top Gun 400: www.ppgpaints.com/#sle. (2)

B. Type P - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, nonstaining, nonbleeding, nonsagging; not intended for exterior use. Product shall be formulated to effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to

ASTM E90 use for drywall or plaster wall systems, bedding electrical boxes and other wall outlets.

1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
 - a. Franklin International, Inc; Titebond GREENchoice Acoustical Smoke & Sound Sealant: www.titebond.com/#sle. (50)
 - b. Hilti, Inc; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com/#sle. (57)
 - c. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle. (31, GG)
 - d. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle. (50 g/L)
 - e. Specified Technologies Inc; Smoke N' Sound Acoustical Sealant: www.stifirestop.com/#sle. (1, GG)
 - f. Top Gun, a brand of PPG Architectural Coatings; Top Gun 200: www.ppgpaints.com/#sle. (1, GG)

2.07 SELF-LEVELING JOINT SEALANTS

- A. Type Q - Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
 1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
 2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Products:
 - a. Dow; DOWSIL SL Parking Structure Sealant: www.dow.com/#sle. (30)
 - b. Dow; DOWSIL FC Parking Structure Sealant: www.dow.com/#sle. (30)
 - c. Pecora Corporation; Pecora 300 SL (Self-Leveling): www.pecora.com/#sle. (40, GG)
 - d. Sika Corporation; Sikasil 728RCS: www.usa.sika.com/#sle. (30)
 - e. Sika Corporation; Sikasil 728SL: www.usa.sika.com/#sle. (29)
 - f. Tremco Commercial Sealants & Waterproofing; Spectrem 900SL: www.tremcosealants.com/#sle. (1)

- B. Type R - Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
 4. Products:
 - a. Pecora Corporation: Pecora 300 SL (Self-Leveling): www.pecora.com/#sle. (40)
 - b. Sherwin-Williams Company; Loxon/Stampede 1SL Polyurethane Sealant: www.sherwin-williams.com/#sle. (50 g/L)
 - c. Sherwin-Williams Company; Loxon/Stampede 2SL Polyurethane Sealant: www.sherwin-williams.com/#sle. (50 g/L)
 - d. Sika Corporation; Sikaflex-1c SL: www.usa.sika.com/#sle. (40)
 - e. Sika Corporation; Sikaflex-2c SL: www.usa.sika.com/#sle. (38)
- C. Type S - Self-Leveling Polyurethane Sealant for Horizontal Expansion Joints: ASTM C920, Grade P, Uses T, M, and O; multicomponent; explicitly approved by manufacturer for horizontal expansion joints.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 30 to 35, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
 4. Tensile Strength: 200 to 250 psi in accordance with ASTM D412.
 5. Products:
 - a. Pecora Corporation; DynaTrol II-SG (Slope Grade): www.pecora.com/#sle. (25)
 - b. Pecora Corporation; Urexpand NR-200: www.pecora.com/#sle. (0)
 - c. Tremco Commercial Sealants & Waterproofing; THC-901: www.tremcosealants.com/#sle. (94)
- D. Type T - Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.

3. Color: To be selected by Architect from manufacturer's standard range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Products:
 - a. Sika Corporation: Sikaflex-1c SL: www.usa.sika.com/#sle. (40)
 - b. Sika Corporation: Sikaflex-2c SL: www.usa.sika.com/#sle. (38)
- E. Type U - Self-Leveling Silyl-Terminated Polyether/Polyurethane (STPE/STPU)
Sealant: ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion.
1. Movement Capability: Plus and minus 35 percent.
 2. Hardness Range: 30 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Products:
 - a. Pecora Corporation; Urexpan NR-201: www.pecora.com/#sle. (50, GG)
- F. Type V - Rigid Self-Leveling Polyurethane Joint Filler: Two part, low viscosity, fast setting; intended for cracks and control joints not subject to significant movement.
1. Hardness Range: Greater than 100, Shore A, and 50 to 80, Shore D, when tested in accordance with ASTM C661.
 2. Products:
 - a. ARDEX Engineered Cements; ARDEX ARDIFIX: www.ardexamericas.com/#sle. (0)

2.08 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
 2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
 3. Open Cell: 40 to 50 percent larger in diameter than joint width.
 4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

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- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Outlet Box Sealant: Resilient sealer pads; use to seal back and sides of all junction boxes recessed in acoustically-rated partitions.
 - 1. Fire-Rated Partitions: Hevi-Duty Nelson FSP Firestop Putty Pads, or equal (no known equal)
 - 2. Non-Fire-Rated Partitions: Lowry's Outlet Box Pad, or equal (no known equal).
- E. Compressible Tape: 1/4-inch-thick, double-sided, closed-cell foam tape; use to seal interior partitions to window mullions.
 - 1. Norseal V988, 3M 4992, or equal
- F. Foam Sealing Tape:
 - 1. General: Open-cell, flexible, polyurethane foam impregnated with synthetic resin and developed to expand into openings and create seals which are airtight, thermally efficient, and vapor permeable.
 - 2. Applications: Door and window shim spaces at heads and jambs, and elsewhere as indicated.
 - 3. Basis-of-Design Product: Tremco Incorporated; ExoAir Trio.
 - 4. Tape Width: As required for intended applications.
- G. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- H. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.
- D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
 - 1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.

2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
3. Arrange for sealant manufacturer's technical representative to be present during tests.
4. Record each test on Preinstallation Adhesion Test Log as indicated.
5. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location; if unable to obtain satisfactory adhesion, report to Architect.
6. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
 1. Remove paints from joint surfaces except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer.
 2. Remove wax, oil, grease, dirt film residues, temporary protective coatings and other residues by wiping with cleaner recommended for that purpose.
 3. Remove dust by blowing clean with oil-free, compressed air.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.
- F. For previously sealed joints, remove all traces of previous sealant and joint backer by mechanical methods, such as by cutting, grinding and wire brushing, in manner not damaging to surrounding surfaces.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:

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1. Width/depth ratio of 2:1.
 2. Neck dimension no greater than 1/3 of the joint width.
 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Fit joint backer securely by compressing backer material 25 percent to 40 percent so no displacement occurs during tooling. Avoid stretching or twisting joint backer.
 - F. Install bond breaker backing tape where backer rod cannot be used, adhering strictly to the manufacturers installation requirements.
 - G. Prime joint substrates where required. Use and apply primer according to sealant manufacturers recommendations. Confine primers to sealant bond surfaces; do not allow spillage or migration onto adjoining surfaces.
 - H. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
 - I. Install sealants to uniform cross-sectional shapes with depths relative to joint widths that allow optimum sealant movement capability as recommended by sealant manufacturer.
 - J. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
 - K. Tool sealants in manner that forces sealant against back of joint, ensures firm, full contact at joint interfaces and leaves a finish that is smooth, uniform and free of ridges, wrinkles, sags, air pockets and embedded impurities.
 - L. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
 - M. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - NTU Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- D. Destructive Adhesion Testing: If there are any failures in first 1,000 linear feet, notify Architect immediately.
- E. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

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- F. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 PROTECTION

- A. Protect sealants from contact with contaminating substances and from damage from construction operations. Cut out, remove and replace contaminated or damaged sealants immediately, so that they are without contamination or damage at time of Substantial Completion.

3.06 CLEANING

- A. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 74 19 - NTU Construction Waste Management and Disposal. Submit documentation for CALGreen compliance in accordance with Division 1 Sustainable Design Requirements.

3.07 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION

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SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation and field painting of exposed interior items and surfaces.
- B. Surface preparation and field painting of exposed exterior items and surfaces.
- C. Surface preparation and field application of exterior high-performance coating systems to items and surfaces scheduled.
- D. Painting of exposed bare and covered pipes and ducts, hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- E. Paint areas impacted by new work, match existing paint color and sheen. Telcom room #1111 to receive all new paint.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 07 92 00 - Joint Sealants.
- C. Section 10 22 13 – Wire Mesh Partitions

1.03 DEFINITIONS

- A. General: Paint includes coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats. Standard coating terms are defined in ASTM D16.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85 degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60 degree meter.
 - 3. Semi-Gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60 degree meter.
 - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60 degree meter.
- B. Environments: The following terms distinguish between different corrosive exposures:
 - 1. "Severe environments" are highly corrosive industrial atmospheres with sustained exposure to high humidity and condensation and with frequent cleaning using strong

chemicals. Environments with heavy concentrations of strong chemical fumes and frequent splashing and spilling of harsh chemical products are severe environments.

2. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.
3. "Mild environments" are industrial atmospheres with normal exposure to moderate humidity and condensation, occasional mold and mildew development, and infrequent cleaning with strong chemicals. Environments with low levels of mild chemical fumes and occasional splashing and spilling of chemical products are mild environments. Normal outdoor weathering is also considered a mild environment.

1.04 REFERENCE STANDARDS

1.05 SYSTEM DESCRIPTION

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2019.
- B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers 2017, v1.2.
- C. EN 15804 - Sustainability of Construction Works - Environmental Product Declarations - Core Rules for the Product Category of Construction Products 2022 (Corrigendum 2021).
- D. ISO 14025 - Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures 2006.
- E. ISO 14040 - Environmental Management - Life Cycle Assessment - Principles and Framework 2006, with Amendment (2020).
- F. ISO 14044 - Environmental Management - Life Cycle Assessment - Requirements and Guidelines 2006, with Amendment (2020).
- G. ISO 21930 - Sustainability in Buildings and Civil Engineering Works — Core Rules for Environmental Product Declarations of Construction Products and Services 2017.
- H. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.06 SUBMITTALS

- A. CALGreen Submittals:
 1. Product Data for CALGreen 5.504.4.3 - Finish Material Pollutant Control, Paints and Coatings: Product data and material safety data sheets (MSDS) for coatings, including printed statement of chemical composition and VOC content of each product used.

2. Aerosol paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for VOC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
 3. Field Verification of on-site product containers: If required by Authority Having Jurisdiction.
- B. Product Data: For each paint system indicated, including:
1. Material List: An inclusive list of required coating materials. Indicate each material and cross reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 2. Preparation instructions and recommendations.
 3. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- C. Verification Samples: For each finish product specified, two samples, minimum size 8 inch square, representing actual product, color, and patterns.
1. Step coats on Samples to show each coat required for system.
 2. Label each coat of each Sample.
 3. Label each Sample for location and application area.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this project, whose work has resulted in applications with a record of successful in-service performance.
- B. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Paint exposed surfaces. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 1. See Section 01 43 39 - Mock-Ups for general requirements for mock-up.

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2. Finish areas designated by Architect. Simulate finished lighting conditions for review of in-place work.
3. Do not proceed with remaining work until workmanship, color, and sheen are approved by Owner and Architect.
4. Final colors to be approved by the Owner and Architect after a maximum of 3 adjustments to each color at no additional cost. Refinish mock-up area as required to produce acceptable work.
5. Wood specified to receive stain finishes: Provide samples on full width boards at least 8 ft. in length. Apply over prepared surface utilizing proposed application method. Final color to be approved by the Owner and Architect after a maximum of 2 adjustments at no additional cost.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1.09 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 degrees F and 90 degrees F.
- C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 degrees F and 95 degrees F.
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.10 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

- B. Quantity: Furnish Owner with an additional three percent, but not less than 1 gallon or 1 case, as appropriate, of each material and color applied.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Manufacturer: PPG Paints, 400 Bertha Lamme Drive Cranberry, PA 16066. Toll Free Tel: 888-PPG-IDEA. Web: www.ppgpaints.com/#sle.
- B. Other Acceptable Manufacturers:
 - 1. Dunn-Edwards.
 - 2. Kelly Moore
 - 3. Sherwin Williams.

2.02 PAINT MATERIALS - GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. VOC Classification: Provide high-performance coating materials, including primers, undercoats, and finish-coat materials, that meet the applicable local, state or federal VOC requirements.
- C. CalGreen Coating VOC Limits: Refer to Section 01 81 13 - NTU Sustainable Design Requirements.
- D. Color: Refer to Drawings for paint sheen and color.

2.03 CONCRETE MASONRY UNIT BLOCK FILLER

- A. Concrete Masonry Unit Block Filler: Factory formulated high-performance latex block fillers.
 - 1. PPG Paints; 6-15XI Speedhide Interior/Exterior Latex Masonry Block Filler (48 g/L VOC).
 - a. Applied at a dry film thickness of not less than 7.0 mils.

2.04 INTERIOR PRIMERS

- A. Interior Concrete and Masonry Primer: Factory-formulated alkali-resistant, zero VOC latex - based interior primer for interior application.
 - 1. PPG Paints; 6-4900XI Speedhide zero Interior Zero VOC Latex Sealer (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.2 mils.

- B. Interior Gypsum Board Primer: Factory-formulated, zero VOC latex-based primer for interior application.
 - 1. PPG Paints; 6-4900XI Speedhide zero Interior Zero VOC Latex Sealer (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.2 mils.
- C. Interior Wood Primer: Factory-formulated, zero VOC latex-based interior wood primer.
 - 1. PPG Paints; 6-4900XI Speedhide zero Interior Zero VOC Latex Sealer (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.2 mils.
- D. Interior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum Primer: Factory-formulated waterborne acrylic rust-inhibitive metal primer.
 - 1. PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.2 mils.

2.05 EXTERIOR PRIMERS

- A. Exterior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic primer for exterior application.
 - 1. PPG Paints; 17-921XI Series Seal Grip Acrylic Universal Primer (84 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.6 mils.
 - 2. Concrete Products Group; "Spec Finish" Coatings. Use for existing and new concrete masonry unit walls.
- B. Exterior Wood Primer for Acrylic Enamels: Factory-formulated acrylic wood primer for exterior application.
 - 1. PPG Paints; 17-921XI Series Seal Grip Acrylic Universal Primer (84 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.6 mils.
- C. Exterior Ferrous, Non-Ferrous, Galvanized Metal, and Aluminum Primer: Factory-formulated waterborne acrylic rust-inhibitive metal primer.
 - 1. PPG Paints; 4020 PF Series Pitt-Tech Plus Interior/Exterior DTM Industrial Primer (91 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.2 mils.

2.06 INTERIOR FINISH COATS

- A. Interior Flat Latex (Gloss Level 1): Factory-formulated flat, zero VOC latex-based interior paint.

- B. Interior Eggshell Acrylic Enamel (Gloss Level 2): Factory-formulated eggshell, zero VOC latex-based interior enamel.
 - 1. PPG Paints; 6-4310XI Series Speedhide zero Interior Latex Eggshell (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.4 mils.
- C. Interior Eggshell Acrylic Enamel (Gloss Level 3): Factory-formulated satin, zero VOC latex-based interior enamel.
 - 1. PPG Paints; 6-4410XI Series Speedhide Zero Interior Zero VOC Latex Satin (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.3 mils.
- D. Interior Satin Acrylic Enamel (Gloss Level 4): Factory-formulated satin, waterborne acrylic interior enamel.
 - 1. PPG Paints; V51-410 Series Break-Through Interior/Exterior Water-Borne Acrylic Satin (less than 50 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.3 mils.
- E. Interior Semi-Gloss Acrylic Enamel (Gloss Level 5): Factory-formulated semi-gloss, zero VOC latex-based enamel.
 - 1. PPG Paints; 6-4510XI Series Speedhide zero Interior Zero VOC Latex Semi-Gloss (0 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.3 mils.
- F. Interior Full-Gloss Acrylic Enamel (Gloss Level 6): Factory-formulated full-gloss waterborne acrylic interior enamel.
 - 1. PPG Paints; V71-610 Series Break-Through Interior/Exterior Water-Borne Acrylic Gloss (less than 50 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.5 mils.
- G. Interior Eggshell Waterborne Acrylic Epoxy:
 - 1. PPG Paints; 16-310 Series Pitt-Glaze WB1 Interior Pre-Catalyzed Water-Borne Acrylic Epoxy Eggshell (95 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.5 mils.
- H. Interior Semi-Gloss Waterborne Acrylic Epoxy:
 - 1. PPG Paints; 16-510 Series Pitt-Glaze WB1 Interior Pre-Catalyzed Water-Borne Acrylic Epoxy Semi-Gloss (97 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.5 mils.

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2. For existing and new interior concrete masonry unit walls: Concrete Products Group; Spec-Finish Coatings.
 - a. Primer – Waterborne Block Filler, applied @ 85 square feet/gal. Backrolled and squeegeed.
 - b. Intermediate Coat – Modified Polyamine Epoxy, applied @ 200 square-feet/gal.
 - c. Topcoat – Aliphatic Polyurethane, applied @ 305 square feet/gal.
- I. Interior Flat Latex Dry Fog:
 1. PPG Paints; 6-725XI Speedhide Super-Tech WB Interior Dry Fog Latex Flat (30 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.2 mils.
- J. Interior Eggshell Latex Dry Fog:
 1. PPG Paints; 6-724XI Speedhide Super-Tech WB Interior Dry Fog Latex Eggshell (30 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.2 mils.
- K. Interior Semi-Gloss Latex Dry Fog:
 1. PPG Paints; 6-727XI Series Speedhide Super Tech WB Interior Dry Fog Latex Semi-Gloss (less than 50 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.2 mils.
- L. Interior/Exterior High Performance Satin Polysiloxane:
 1. PPG Paints; PSX 805 Engineered Siloxane Satin (75 g/L VOC).
 - a. Applied at a dry film thickness of not less than 3.0 mils.

2.07 STAIN FINISHES FOR INTERIOR WOOD SUBSTRATES

- A. Interior Wood Bio-Based Stain Finish:
 1. Bio-based oil interior wood stain: Timber Pro; Log & Siding Formula, Smooth
 2. Sealer: Timber Pro Crystal Urethane Interior clear waterborne sealer.
- B. Interior Wood Stain and Sanding Sealer:
 1. Stain:
 - a. PPG Deft Water Based Interior Wood Stain DFT300 Series.
 2. Sealer:

- a. PPG Deft Sanding Sealer Interior Water Based DFT61.
- 3. Interior Satin Wood Varnish: Clear, waterborne, acrylic/urethane.
 - a. PPG Deft Clear Polyurethane Interior Water Based Acrylic Satin DFT159.

2.08 EXTERIOR FINISH COATS

- A. Exterior Flat Acrylic Paint: Factory-formulated flat 100% acrylic latex paint for exterior application.
 - 1. PPG Paints; 6-610XI Series Speedhide Exterior 100 percent Acrylic Latex Flat (less than 50 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.5 mils.
- B. Exterior Orange Peel for concrete block finish: Roller Applied. For existing and new concrete masonry unit walls. Allow for one primary color and two accent colors.
 - 1. Concrete Products Group, "Spec Finish" Coating products:
 - a. Primer – Waterborne Block Filler, applied @ 85 square feet/gal. Backrolled and squeegeed.
 - b. Intermediate Coat – Modified Polyamine Epoxy, applied @ 200 square-feet/gal.
 - c. Topcoat – Aliphatic Polyurethane, applied @ 305 square feet/gal.
- C. Exterior Satin Acrylic Paint: Factory-formulated satin waterborne acrylic paint for exterior application.
 - 1. PPG Paints; V51-410 Series Break-Through Interior/Exterior Water-Borne Acrylic Satin (less than 50 g/L VOC).
 - a. Applied at a dry film thickness of not less than 1.3 mils.

Metal Substrates

- 2. PPG Paints; 90-1110 Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Satin (85 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.0 mils.
- D. Exterior Semi-Gloss Acrylic Paint: Factory-formulated semi-gloss waterborne acrylic enamel for exterior application.

Metal Substrates

- 1. PPG Paints; 4216 HP Series Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Semi-Gloss (90 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.0 mils.

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- E. Exterior Full-Gloss Acrylic Enamel: Factory-formulated full-gloss waterborne acrylic-latex enamel for exterior application.
 - 1. PPG Paints; 90-1310 Pitt-Tech Plus Interior/Exterior DTM Industrial Enamel Gloss (90 g/L VOC).
 - a. Applied at a dry film thickness of not less than 2.0 mils.
- F. Exterior High Performance Low-VOC Polyester Acrylic Polurethane Coating
 - 1. Intermediate Coat: PPG Paints; Amerlock 400 or Amerlock 2 400 epoxy high solids intermediate coat as recommended by manufacturer for intended applications. (<100g/L).
 - a. Applied at a dry film thickness of not less than 2.0 mils.
 - 2. Topcoat: PPG Paints; PMC Amershield VOC, Low-VOC Polyester Acrylic Polurethane Coating (<85 g/L VOC).
 - a. Applied at a dry film thickness of not less than 3.0 mils.

2.09 STAIN FINISHES FOR EXTERIOR WOOD SUBSTRATES

- A. Semi-Transparent Bio-Based Wood Finish: Exterior bio-based oil wood stain.
 - 1. Stain: Timber Pro; Log & Siding Formula [Classic] [Smooth]
 - 2. Sealer: Timber Pro; Clear Log and Siding, Smooth Formula
- B. Semi-Transparent Wood Finish: Exterior waterborne wood stain.
 - 1. Basis of Design:
 - a. **PPG; ProLuxe: VOC<100g/L; approximately 25% solids by volume.**
 - 2. Acceptable Products:
 - a. Cabot; Semi-Transparent Acrylic Siding Stain 1300 Series: VOC<100g/L; approximately 25% solids by volume.
 - b. Duckback; Superdeck Semi-Transparent Waterborne Stain, 2400 Series.
 - c. Sherwin-Williams; Superdeck Semi-Transparent Acrylic Stain.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

- C. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.
 2. If a potential incompatibility of primers applied by others exists, obtain the following from the primer applicator before proceeding:
 - a. Confirmation of primer's suitability for expected service conditions.
 - b. Confirmation of primer's ability to be top coated with materials specified.

3.02 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
 2. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
 - a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 3. Wood Substrates: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Smoothly sand surfaces exposed to view and dust off.

- a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer, before applying primer.
 - b. Immediately on delivery, prime edges, ends, faces, undersides, and backsides of wood to be coated.
 - c. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
4. Ferrous Metal Substrates: Clean ungalvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
 - a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 6.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.
5. Non-Ferrous Metal Substrates: Clean non-ferrous and galvanized surfaces according to manufacturer's written instructions for the type of service, metal substrate, and application required.
 - a. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
 1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
 2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
 3. Use only the type of thinners approved by manufacturer and only within recommended limits.
 4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. General: Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use applicators and techniques best suited for the material being applied.
 - 2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
 - 3. Coating surface treatments and finishes are indicated in the coating system descriptions.
 - 4. Provide finish coats compatible with primers used.
 - 5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
 - 1. The number of coats and film thickness required is the same regardless of application method.
 - 2. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 45 23 - NTU Testing and Inspecting Services, for general requirements for field inspection and testing.
- B. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
 - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.05 CLEANING

- A. After completing painting, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.06 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
- C. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

3.07 INTERIOR PAINT SCHEDULE

- A. Concrete:
 - 1. General: Two finish coats over a primer.
 - 2. Primer: Interior zero VOC, **latex-based** primer as specified for substrate indicated.
 - 3. Finish Coats: Interior low-sheen, zero VOC **latex-based** enamel.
- B. Concrete Masonry Units:
 - 1. General: Two finish coats over a primer.
 - 2. Primer: Concrete masonry unit **latex** block filler.
 - 3. Finish Coats: Interior low sheen zero VOC **latex-based** enamel.
- C. Gypsum Board:
 - 1. Walls and Ceilings to receive Flat Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior flat zero VOC **latex-based** paint.
 - 2. Walls and Ceilings to receive Low-Luster (Eggshell) Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior low-luster (eggshell) zero VOC **latex-based** enamel.

3. Walls and Ceilings to receive Satin Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
 4. Walls and Ceilings to receive Semi-Gloss Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior semi-gloss zero VOC **latex-based** enamel.
 5. Walls and Ceilings to receive Full-Gloss Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior gloss zero VOC **waterborne acrylic** enamel.
 6. Walls and Ceilings to receive Semi-Gloss Epoxy Finish:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior zero VOC **latex-based** primer as specified for substrate indicated.
 - c. Finish Coats: Interior Semi-Gloss **Pre-Catalyzed Water-Borne Acrylic Epoxy** finish.
- D. Metal Doors and Frames, and Other Non-Prefinished Miscellaneous Metal, metal stairs, pipe and tube railings, and decorative metal exposed piping, conduits, and ductwork, :
1. Ferrous Metal:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
 2. Zinc-Coated Metal:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.

- E. Typical Exposed Structural and Steel Items not indicated to be Painted with Interior High Performance Topcoats.
1. Ferrous Metal:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
 2. Zinc-Coated Metal:
 - a. General: Two finish coats over a primer.
 - b. Primer: Interior **waterborne acrylic** as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
- F. Selected Exposed Steel Items indicated to be Painted with Interior High Performance Topcoats including exposed structural steel, architecturally exposed structural steel, metal stairs, pipe and tube railings, and decorative metal.
1. General: One topcoat over shop primer.
 2. Primer: Shop-applied in applicable Division 5 Section.
 3. Topcoat: Interior high performance **satin polysiloxane**
- G. Wood - Opaque Finish: Walls and Ceilings to receive Flat Finish:
1. General: Two finish coats over a primer.
 2. Primer: Interior zero VOC, **latex-based** primer as specified for substrate indicated.
 3. Finish Coats: Interior Flat zero VOC **latex-based** paint.
- H. Wood - Opaque Finish: Trim to receive Satin Finish:
1. General: Two finish coats over a primer.
 2. Primer: Interior zero VOC, **latex-based** primer as specified for substrate indicated.
 3. Finish Coats: Interior satin zero VOC **waterborne acrylic** enamel.
- I. Wood - Transparent Finish and varnish for miscellaneous field-finished wood::
1. General: Two coats varnish minimum over one coat sanding sealer and one coat stain.
 2. Stain: Interior **water based**.

3. Sanding Sealer: Interior **water based**.
4. Varnish: Interior clear satin **waterborne acrylic/urethane**.
- J. Wood - Transparent Penetrating Finish for softwood substrates:
 1. General: One coat penetrating sealer over one coat stain.
 2. Stain: Interior bio-based oil.
 3. Sealer: Interior clear waterborne urethane.

3.08 EXTERIOR PAINT SCHEDULE

- A. Concrete:
 1. General: Two finish coats over primer.
 2. Primer: Exterior **acrylic** primer as specified for substrate indicated.
 3. Finish Coats: Exterior flat **acrylic latex** paint.
- B. Concrete Unit Masonry:
 1. General: Two finish coats over a primer.
 2. Primer: Concrete masonry unit **latex** block filler.
 3. Finish Coats: Exterior flat **acrylic latex** paint.
- C. Cement Plaster: Refer to Section 09 24 00 - NTU Cement Plastering for finish coat system.
- D. Metal Doors and Frames, and Other Non-Prefinished Miscellaneous Metal:
 1. Ferrous Metal:
 - a. General: Two finish coats over primer.
 - b. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.
 2. Zinc-Coated Metal:
 - a. General: Two finish coats over primer.
 - b. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 - c. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.
- E. Aluminum:

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1. General: Two finish coats over primer.
 2. Primer: Exterior **waterborne acrylic** primer as specified for substrate indicated (not required on shop-primed items).
 3. Finish Coats: Exterior semi-gloss **waterborne acrylic** enamel.
- F. Selected Exposed Steel Items indicated to be Painted with Exterior High Performance Topcoats including exposed structural steel, architecturally exposed structural steel, metal stairs, pipe and tube railings, and decorative metal.
1. General: One topcoat over one intermediate coat and shop primer.
 2. Primer: Shop-applied in applicable Division 05 Section.
 3. Intermediate Coat: **Epoxy high-solids** intermediate coat as recommended by manufacturer of high-performance topcoat for intended application.
 4. Topcoat: Exterior semi-gloss **Polyester Acrylic Polyurethane** Coating
- G. Wood: Walls and Soffits to receive Stain Finish:
1. General: One finish coat, minimum.
 2. Finish Coat(s): Exterior Semi-Transparent waterborne stain.
- H. Wood: Walls and Soffits to receive Semi-Transparent Bio-Based Wood Finish
1. General: Exterior clear sealer over two coats stain.
 2. Stain: Exterior bio-based oil.
 3. Sealer: Exterior clear sealer.
- I. Poly-Ash Composite Siding:
1. General: Two finish coats over pre-primed composite material
 2. Primer: Pre-primed. See Section 07 46 49 - NTU Poly-Ash Siding and Trim
 3. Finish Coats: Exterior flat **acrylic latex** paint.
- J. Wood Benches: All bench surfaces: Top, bottom, edges and ends:
1. General: Apply cleaner/neutralizer prior to finish sanding. Two coats penetrating stabilizer.
 2. Stabilizer: Exterior transparent, penetrating.

END OF SECTION

SECTION 10 22 13 - WIRE MESH PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wire mesh partitions and gates at Telcom Room # 1111.

1.3 DEFINITIONS

- A. Intermediate Crimp: Wires pass over one and under the next adjacent wire in both directions, with wires crimped before weaving and with extra crimps between the intersections.
- B. Lock Crimp: Deep crimps at points of the intersection that lock wires securely in place.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meetings:
 - 1. Pre-Installation Conferences: Contractor to conduct meetings at site with installer and all other trades involved prior to fabrication and start of Work. Familiarize installer with conditions at site and related Work.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, anchorage, and attachments to other work.
 - 2. Provide location template drawings for items supported or anchored to permanent construction
- C. Samples for Initial Selection: Furnish manufacturer's complete color selection showing full range of colors and finish characteristics for units with factory-applied color finishes.

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- D. Samples for Verification: Furnish materials to be used with labels indicating colors, finish characteristics, and locations of the Work. Samples will be reviewed for color and appearance only. Furnish the following.
 - a. Wire Mesh: 6 inch x 6 inch sample in color selected.
 - b. Frame: 6 inch length in color selected.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Welding certificates.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wire mesh partition hardware to include in maintenance manuals.
- B. Record drawings.

1.8 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with all applicable requirements of the laws, codes, ordinances and regulations authorities having jurisdiction. Obtain necessary approvals from all such authorities. B. Qualifications:
 - 1. Contractor: Contractor is responsible for quality control of the Work.
 - 2. Manufacturer: A firm experienced in successfully producing work similar to that indicated for this Project, with a record of successful in-service performance, and with sufficient production capacity to produce required units without causing delay in the Work.
 - 3. Installer: An installer trained in the use of the materials and equipment to be employed in the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wire mesh items in manufacturer's original packaging, with label identifying items, to provide protection during transit and project-site storage. Use vented plastic.
- B. Inventory wire mesh partition door hardware on receipt and provide secure lockup for wire mesh partition door hardware delivered to Project site.
 - 1. Tag each item or package separately with identification and include basic installation instructions with each item or package.

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- C. Storage and Handling Requirements: Store materials in accordance with manufacturer's instructions in a protected dry location off ground. Do not open packaging nor remove labels until time of installation.

1.10 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Cisco-Eagle Welded Wire Security Cages, or equal. Details to be determined.

2.2 MATERIALS – GENERAL

- A. Single Source Responsibility:
 1. Obtain materials from a single manufacturer.
 2. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.3 MATERIALS

- A. Wire Mesh Partitions:
 1. Thickness: 0.189 inch.
 2. Weight: 2.939 lbs/sq. ft.
 3. Maximum sheet size: 48 inches x 120 inches.
 4. Open area: 6 percent.
- B. GATES
 1. 3' – 6" wide swing gate prepared for specified hardware.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.

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- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate and Furnish: Anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of items having integral anchors embedded in concrete or masonry construction. Coordinate delivery of such items to the project site.

3.3 WIRE MESH PARTITIONS ERECTION

- A. Anchor wire mesh partitions to floor with 3/8-inch- diameter postinstalled expansion anchors at 12 inches o.c. through anchor clips located at each post and corner. Shim anchor clips as required to achieve level and plumb installation.
 - 1. Anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if indicated on Shop Drawings.
- B. Provide seismic supports and bracing as indicated or, if not indicated, **as recommended by manufacturer** and as required for stability, extending and fastening members to supporting structure.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace defective work, including framing that is warped, bowed, or otherwise unacceptable.

END OF SECTION

SECTION 27 05 00

COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes, but is not necessarily limited to:
 - 1. Common standards and procedures for the Communications Work.
 - 2. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of the Communications Systems. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction.
- B. Provisions of this Section apply to Communications Work, including the following Sections:
 - 1. Section 27 05 26 – Grounding and Bonding for Communications Systems
 - 2. Section 27 05 29 – Hangers and Supports for Communications Systems
 - 3. Section 27 05 33 – Conduits and Backboxes for Communications Systems
 - 4. Section 27 05 36 – Cable Trays for Communications Systems
 - 5. Section 27 05 53 – Identification for Communications Systems
 - 6. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
 - 7. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
 - 8. Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - 9. Section 27 11 23 – Communications Cable Management
 - 10. Section 27 15 00 – Communications Horizontal Cabling

1.02 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI/TIA/EIA-568-C.1-2009 Commercial Building Telecommunications Cabling Standard
 - 2. ANSI/TIA-568-D Optical Fiber Cabling Components Standard (2016)
 - 3. ANSI/TIA/EIA-606-B-2016 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

1.03 DEFINITIONS

A. General Abbreviations used in these specifications. Refer additionally to the abbreviations list appearing on the Drawings.

1. ADA	Americans With Disabilities Act.
2. AFC	Above Finished Ceiling.
3. AFF	Above the Finished Floor.
4. BLDG	Building
5. CAT	Category
6. CL	Centerline
7. DIV	Division
8. (E)	Existing
9. FBO	Furnished By City
10. HR	Home Run
11. ID	Inside Diameter
12. LAN	Local Area Network
13. MAX	Maximum
14. NIC	Not In Contract.
15. OD	Outside Diameter
16. OFE	City Furnished Equipment.
17. PSRH	Project Standard Receptacle Height.
18. PSSH	Project Standard Switch Height.
19. TYP	Typical
20. UON	Unless Otherwise Noted.

B. Reference to Named Products

1. Selected Item: Item so noted was selected based on comparative testing of similar products. Procedure for determination of equivalence is noted in the specification for the item(s).

2. System Design Basis: Item so noted interacts with other system items to produce total system function. Substitution of this item may require coordinated substitution of other system items.
3. Design Basis: Item so noted was used as basis for system drawings to establish features, size, etc. Use of specified equivalents may require adjustment of physical layout or wiring, but does not affect system function. No preference is implied.

1.04 SUBMITTALS

- A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.
- B. General Requirements
 1. Submit all materials for review arranged in same order as Specifications, individually referenced to Specification Section, Paragraph and Contract Drawing number. Conform in every detail as applies to each referencing Section.
 2. Submit in PDF format.
 3. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.
 4. Progress Schedule: Comply with Division 1.
- C. Contractor and Key Personnel Experience.
 1. A minimum of 30 days prior to installation, submit documentation of the experience of the low voltage systems, equipment and infrastructure contractor(s) and of their key personnel.
 2. Qualifications shall be provided for:
 - a. the low voltage systems, equipment and infrastructure contractor(s),
 - b. the low voltage systems, equipment and infrastructure installer(s),
 - c. and the supervisor(s) (if different from the installers),
 - d. the low voltage systems, equipment, and infrastructure project engineer,
 - e. custom control system programmer.
 3. A copy of the Contractor's C-7 license or C-10 licenses - both if Contractor has both.
 4. A copy of testing personnel certification(s) that demonstrate that the proposed personnel have the necessary training and certifications to conform with the proof of performance testing requirements of this Division and that they are properly trained in the use of the testing equipment that will be employed by the contractor.
 5. Copies of Contractor's Structured Cabling System (SCS) manufacturer's authorized vendor/installer Certification document(s).
 6. Refer to Quality Assurance paragraph in this section for complete requirements.
- D. Manufacturer's Product Data:

1. Manufacturer's Product Data Sheets. Collate in sequence of List of Materials:
2. Data sheet for each item in each Communications Section, including all accessories, clearly marked for proposed product.
3. Material Safety Data Sheet, where applies.
4. List of Materials Schedule. For each item, include:
 - a. Referencing Specification Section
 - b. Referencing Paragraph
 - c. Referencing Drawing, if specified only on plans
 - d. Manufacturer.
 - e. Model number.
 - f. Listing, including name of Nationally Recognized Testing Laboratory.
 - g. Precede each submittal book with a summary schedule, with columns for each item above and rows for each item submitted, per the example schedule below:
 - h.

Specification Section	Paragraph	Contract Drawing Reference	Manufacturer	Model No.	UL/ETL/C LA Listed
27 05 00	2.03C		XYZ	123	Y
27 15 00	2.07A1		AAA	34-56	Y
		T0.1	ZZY	456	Y

E. Field (Installation) Drawings:

1. General
 - a. Drawings shall present the proposed installation using the makes and models of devices proposed for use this project; replace vendor neutral nomenclature used in bid set with the actual part numbers to be installed or provide a lookup table in the drawings to permit determining the actual part number.
 - b. Where the existing systems and/or infrastructure are used and integrated into the work of the project, indicate them on drawings, including points of interface and demarcation of existing and new work.
 - c. Collate, in sequence, at least the following minimum drawings, for each infrastructure and system to be installed under the work of this contract:
2. Drawing index/symbol sheet.
3. Site plans, floor plans and reflected ceiling plans.
 - a. General
 - 1) The identifier for each termination and cable shall appear on the drawings, either directly on the floor plans, through an associated schedule or a unique identifier associated with a fully annotated single line diagram.
 - 2) Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
 - 3) At scale of Contract Documents, show:
 - 4) Device locations and type
 - 5) Rough-in.
 - 6) Mounting height.

- 7) Conduit size.
- 8) J-hook routes
- 9) Wire type.
- 10) Wire fill.
- 11) On the floor plans, indicate floor and wall mounted devices and pathway below a height of 7 feet above finish floor. Indicate the locations of the communications rooms and provide reference to the enlarged communications rooms plans.
- 12) On the reflected ceiling plan, indicate ceiling and wall mounted devices and pathway above a height of 7 feet above finish floor. Indicate the locations of the communications rooms and provide reference to the enlarged communications rooms plans.
- b. Communications Infrastructure
 - 1) Provide registered communications distribution designer (RCDD) approved, drawings depicting a complete communication infrastructure in accordance with ANSI/TIA-606-B. The drawings should provide details required to prove that the distribution system shall properly support connectivity from the communications rooms including EF, ER, CD's, BD's, and FD's to the telecommunications work area outlets.
 - 2) The following drawings shall be provided as a minimum:
 - 3) T1- Layout of complete building per floor - Building Area/Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways. Layout of complete building per floor. The drawing indicates location of building areas, serving zones, vertical backbone diagrams, telecommunications rooms, access points, pathways, grounding system, and other systems that need to be viewed from the complete building perspective.
 - 4) T-2 Serving Zones/Building Area Drawings - Drop Locations and Cable Identification (ID'S). Shows a building area or serving zone. These drawings show drop locations, telecommunications rooms, access points and detail call outs for common equipment rooms and other congested areas.
 - 5) A complete jack numbered plan set in City standard jack numbering format in printed and AutoCAD format. Number plans with all jacks for each floor indicated on a single drawing sheet. Data, voice, wireless and security jacks shall appear on the same page. Symbols shall be indicated for the data, wall phone, wireless, inside camera, outside camera, as applies. A four digit jack numbers shall be printed by each jack symbol. Jack plan shall be approved by the City's Representative before the cabling begins.
- c. Audiovisual Systems, including MATV Systems, Audiovisual Systems and Public and Mass Notification Systems
 - 1) Indicate:
 - 2) Device locations, orientation and depict integration of systems that need to be viewed from the complete building perspective.
 - 3) For distributed speaker systems, indicate limits of zones of coverage.
 - 4) Vertical and horizontal pathways
 - 5) Equipment rooms and racks
 - 6) Reference to enlarged plans and related details.
4. Enlarged Plans
 - a. General
 - 1) Indicate at least as much information as is provided in the Contract Documents, supplemented by the dimensions and arrangement of the proposed equipment, trade coordination and field conditions.
 - b. Communications Infrastructure.

- 1) Communications Rooms Drawings
 - 2) Provide T3 drawings in accordance with ANSI/TIA-606-B that include telecommunications rooms plan views, pathway layout (cable tray, racks, ladder-racks, etc.), mechanical/electrical layout, and cabinet, rack, backboard and wall elevations. Include rack details, proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearance for maintenance and operation.
 - 3) At scale of Contract Documents, the Contractor shall submit scaled drawing elevations (showing dimensions, mounting locations and associated frames & equipment) for all required assemblies, including but not limited to:
 - 4) Rack locations
 - 5) Wall mounted plywood backboards
 - 6) Wall mounted backbone cabling and major station cable bundles.
 - 7) Wall mounted and tray mounted splice cases
 - 8) Wall mounted copper cable protectors and terminal blocks.
 - 9) Wall mounted fiber optic cable terminations.
 - 10) Clearances
 - 11) Backboard Wire and Cable Management
 - 12) Rack elevations, including
 - 13) Copper cable patch panels.
 - 14) Fiber optic cable patch panels.
 - 15) Rack mounted wire managers
 - 16) Hold clears for equipment provided by Others.
 - 17) Reference to mounting details.
 - 18) Power strips
 - 19) UPS
 - 20) Drawings may also be an enlargement of a congested area of T1 or T2 drawings.
 - c. Audiovisual Systems, including MATV Systems, Audiovisual Systems and Public and Mass Notification Systems
 - 1) At equipment rooms
 - 2) Rack elevations, showing
 - 3) all equipment occupying the actual number of rack units required
 - 4) blank panels
 - 5) vent panels
 - 6) aux panels
 - 7) power strips
 - 8) UPS
 - 9) Reference mounting details.
5. System Conduit and Riser Diagrams,
- a. General:
 - 1) Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment.
 - 2) Single line diagram of structured wiring
 - 3) Grounding and bonding scheme
 - 4) Terminal cabinets.
 - 5) Coordination with floor plans.
 - 6) Wire runs not shown on floor plans.
 - 7) Wire type.
 - 8) Wire fill.
 - 9) Interface to work provided by work of other Sections, City Furnished Equipment, existing equipment and/or future equipment.

- 10) For Audiovisual Systems, indicate digital or analog signal type and voltage levels (dBmV, microphone, line level, speaker level) or optical signal levels.
6. Detail Drawings
 - a. Identify each item requiring seismic restraint installation in accordance with CBC Chapter 16. Include floor mounted items weighing more than 400 pounds and wall mounted or suspended items weighing more than 20 pounds.
 - b. Supports for such items shall be provided support, bracing, and anchorage, designed by the Contractor in accordance with the following criteria:
 - 1) Design to resist seismic forces in accordance with CBC Chapter 16.
 - 2) Minimum Design Parameters - As defined for the Project in Division, with respect to Occupancy Category, Site Classification, Seismic Design Category, Importance Factor, Spectral Acceleration and SDI.
 - c. Mounting details:
 - 1) Specific details of restraints including anchor bolts submitted under the Section 27 05 29 – Hangers and Supports for Communications Systems for mounting and maximum loading at each location, showing compliance and coordination with Code and the project Architectural, Structural and Mechanical Documents.
 - 2) Stamped and signed by an Engineer licensed in the Project jurisdiction for work of this type.
 - 3) Submit an accompanying Engineering analysis stamped and signed by an Engineer licensed in California for work of this type, indicating that the Equipment Enclosure System will comply with California Building Code for the Project Seismic Zone when loaded with the weight of the equipment submitted.
 - 4) Show calculations on drawings or in bound volume for review by Authorities having jurisdiction.
 - 5) Show loads, type and strength of connections, sizes, dimensions, materials, etc.
 - 6) Provide details for:
 - 7) Floor Mounted Equipment Cabinet and Rack anchorage.
 - 8) Wall Mounted Racks and Enclosures anchorage, including coordination with backing.
 - 9) Cable Runway and Cable Tray. Indicate tray type, dimensions, support points, and finishes.
 - d. For systems with contractor or manufacturer programmed control and human interfaces the Contractor must allow sufficient time for the programming of all software configurable audio, video and control systems. Contractors must evaluate the systems functional requirements and user interface and then allow time in their bid accordingly. The system description as well as an end user interview will provide the Contractor with the necessary information needed to proceed with the programming. Any questions as to the systems functional requirements must be sent in written RFI form to the City. All programming schemes must be submitted to the City for approval before programming starts. This includes the appearance of all user interfaces, touch panel layouts, preset and sub-preset information (acquired through client interviews), and speaker control schemes. The Contractor will also submit a narrative for the control system concept to the City for approval. The Contractor is to interview the City and their representatives to acquire the necessary information needed to allow for the proper programming of this system. The Contractor, after interviewing the City, will then submit a written report stating his interpretation of the client's requirements for approval by City. Only after the Client and City have approved

the programming report may the Contractor proceed with the programming of this system. Submit at least:

- 1) Narrative of the sequence of operation.
- 2) Color, full-size layouts of each touchpanel and/or computer screen (menu) image, cross-referenced to the sequence of operations.
- 3) Show chaining of sub-menus.
- e. Faceplate and Receptacles
 - 1) Receptacle and jack arrangement for each condition.
 - 2) Labeling of receptacle/jacks and plate
 - 3) Plate material.
 - 4) Plate finish.
 - 5) Connector types.
 - 6) Connector dimensioned layout.
- f. Pathway
 - 1) Cable tray installation details, indicating complete system of fittings and radiussed pathways provided.
 - 2) Firestopping. Listed fire stop system documentation supporting proposed systems ability to conform with the project requirements.
 - 3) Penetrations. All conduit and piping wall, ceiling, floor, and roof penetrations, including both fire rated or non-rated, should be submitted for review prior to installation.
 - 4) For cored penetrations through concrete partitions, submit proposed work plan in the form of Coring/Sawcutting Summary Description as described in Section 27 05 33 – Conduits and Backboxes for Communications Systems.
 - 5) Details of flexible raceway connections to be made to vibrating equipment
 - 6) Details of J-Box and sealant application for the typical conditions listed in Section 27 05 48 – Noise and Vibration Controls for Communications System, and a schedule of rooms to receive application of mastic and sealant at J-Boxes
 - 7) An itemized list of all items of equipment to be fitted with flexible electrical connections.
 - 8) Conduit racking details.
- g. California Access Compliance Manual and Americans with Disabilities Act (ADA) compliance.
- h. Terminal cabinets: Terminations.

F. Cabling and Equipment Test Plan

1. Submit complete documentation of the proposed test plan and equipment to be used to document that the performance of the cabling, equipment, sub-systems and complete systems installed under the work of this project conform with the performance standards outlined in each specification section.
2. Submit not less than 45 days prior to the proposed test date. Include procedures for certification, validation, and testing.
3. Submit manufacturer's or recognized national test laboratory's calibration certificate one (1) month before any post-installation testing begins. Date on test unit calibration certificate shall be no longer than one (1) year prior to the date that post-installation testing is scheduled to begin.
4. Submit a copy of the Test Equipment manufacturer's recommended testing procedure for each of the structured cabling system elements listed above in this section.

G. Test Reports

1. Manufacturer's Field Reports
 - a. Factory reel tests
2. Project Site Test Reports:
 - a. Submit following system completion and prior to and as condition precedent to Acceptance Review and Testing of the Work of this Section.
 - b. Schedule: Submit test reports in timely manner relative to Project schedule such that the City's Representative may conduct verification of submitted test data without delay of scheduled progress.
 - c. Provide test reports as specified within each section of Division 27 requiring performance testing.
 - d. Content: Include at least:
 - 1) Time and date of test.
 - 2) Personnel conducting test.
 - 3) Test equipment, including serial and date of calibration.
 - 4) Test object.
 - 5) Procedure used.
 - 6) Results of test
 - 7) Numerical or graphical presentation.
 - e. Submit copy of final results on paper and in electronic form, organized by circuit number, consistent with circuit numbering scheme used in preparing submittal drawings and in labeling receptacles and terminations.
 - 1) Submit machine-generated documentation and raw data of all test results in electronic form on CD-R media
 - 2) Where the electronic documentation requires use of a proprietary computer program to view the data, provide the City's Representative with 1 licensed copy of the software.

- H. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the City's Representative, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.
- I. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions using format in Division 1 Section "Closeout Procedures".

1.05 QUALITY ASSURANCE

A. Qualifications

1. Telecommunications Qualifications
 - a. Work under this section shall be performed by and the equipment shall be provided by the telecommunications contractor and key personnel. Qualifications shall be provided for:
 - 1) the telecommunications system contractor,
 - 2) the telecommunications system installer,
 - 3) and the supervisor (if different from the installer),
 - 4) the project engineer,
 - 5) the custom control system programmer.

- b. A minimum of 30 days prior to installation, submit documentation of the experience of the telecommunications contractor and of the key personnel.
 2. Telecommunications Contractor
 - a. The telecommunications contractor shall be a firm which is regularly and professionally engaged in the business of the applications, installation, and testing of the specified telecommunications systems and equipment.
 - 1) The telecommunications contractor shall demonstrate experience in providing successful telecommunications systems within the past 3 years.
 - 2) Submit documentation for a minimum of three and a maximum of five successful telecommunication system installations for the telecommunications contractor.
- B. Test Plan
1. Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the UTP cabling 15 days prior to the proposed test date. Include procedures for certification, validation, and testing.
- C. Designated Supervisor: Provide a designated supervisor present and in responsible charge in the fabrication shop and on the Project Site during all phases of installation and testing of the Work of this Section. This supervisor shall be the same individual through the execution of the Work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.
- D. Reference Documents: At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies.
1. A complete set of the latest stamped, actioned submittals of record.
 2. A complete set of manufacturer's original operation, instruction and service manuals for each equipment item.
- E. Test Equipment
1. Requirements:
 - a. Maintain and operate test equipment at the fabrication shop and the job site for both routine and Acceptance Testing of the Work of this Section.
 - b. Maintain test equipment at the job site while work is in progress from installation of equipment racks until City Acceptance of this Work; thereafter remove all of this test equipment from the job site.
 - c. Unless otherwise indicated, test equipment shall remain property of the Contractor.
 - d. Provide all required test cables, jigs and adapters.
 - e. Provide equipment with traceable calibration, with calibration date not greater than one year prior to the date of the use of the equipment to perform the specified testing.
 2. Equipment: Specified in individual Sections.

1.06 REGULATORY REQUIREMENTS

- A. Regulations Applicable: Including but not limited to those defined in Section 01 11 00 – Summary of Work.
 - 1. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
 - 2. Safety Agency Listing: All devices provided under the Work of this Section which are connected to the Project electrical system shall be listed by a Nationally Recognized Testing Laboratory, and shall be so labeled.
 - 3. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the City's Representative. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Procedures:
 - 1. In accordance with Section 01 60 00 – Product Requirements and as specified in the individual sections of Division 27.
- B. General
 - 1. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for telecommunications cabling and equipment placed in storage.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Connecting hardware shall be rated for operation under ambient conditions of 32 to 140 degrees F and in the range of 0 to 95 percent relative humidity, non-condensing.

1.09 SEQUENCING

- A. Comply with the following.
 - 1. Reproducibles:
 - a. 1 set of reproducible bond.
 - b. CAD files: 1 set.

1.10 OPERATING AND MAINTENANCE DATA

- A. Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance of products provided as a part of the telecommunications cabling and pathway system.

1. Submit operations and maintenance data in accordance with Section 01 70 00 – Execution and Closeout Requirements and as specified herein not later than 2 months prior to the date of beneficial occupancy.

1.11 PROJECT RECORD DOCUMENTS

- A. Comply with Section 01 70 00 – Execution and Closeout Requirements, and the following.

1. Record Drawings
 - a. CAD.
 - 1) Use a computer aided drafting (CAD) system in the preparation of record drawings for this Project. CAD system shall produce files in AutoCAD® .DWG format, latest version at time of bid. (Campus Standard, no substitution permitted).
 - b. Except where prohibited by Contract, City's Representative will furnish CAD backgrounds in AutoCAD® .DWG format, latest version at time of bid, for use by the Contractor in preparing Record Drawings.
2. Provide drawings including documentation on cables and termination hardware in accordance with ANSI/TIA/EIA-606-A. The drawings shall include schedules to show information for cut-overs and cable plant management, patch panel layouts and cover plate assignments, cross-connect information and connecting terminal layout as a minimum. Provide the following drawing documentation as a minimum:
 - a. Cables - A record of installed cable shall be provided in accordance with ANSI/EIA/TIA-606-A. The cable records shall include the required data fields for each cable and complete end-to-end circuit report for each complete circuit from the assigned outlet to the entry facility in accordance with ANSI/TIA/EIA-606-A. Include manufacture date of cable with submittal.
 - b. Termination Hardware - A record of installed patch panels, cross-connect points, distribution frames, terminating block arrangements and type, and outlets shall be provided in accordance with EIA TIA/EIA-606-A. Documentation shall include the required data fields as a minimum in accordance with EIA TIA/EIA-606-A.
3. Spare Parts
 - a. In addition to the requirements of Section 01 70 00 – Execution and Closeout Requirements, provide a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.
4. For each IDF, the contractor shall provide (1) printed copy of the outlet numbering plan for the IDF-serving area. The plan shall be printed on D-size, dated, with contractor contact information, and a framed for hanging on the IDF wall.

1.12 WARRANTY SERVICE

- A. In addition to provisions of 01 70 00 – Execution and Closeout Requirements, provide the following.
1. Response Time: Provide a qualified technician familiar with the work at the Project Site within 24 hours after receipt of a notice of malfunction. Provide the City's Representative with telephone number attended 8 hours a day, 5 days a week, to be called in the event of a malfunction.
- B. Provide all additional Warranties as defined in each Communication Systems Section.

1.13 ACCEPTANCE REVIEW AND TESTING PROCEDURES

- A. Complete all Work of this Section. Submit Test Report. Submit review copies of Operating and Maintenance Manuals, less reduced set of Record Drawings. Notify the City's Representative in writing that the Work of these Sections is complete and fully complies with the Contract Documents. Request Acceptance Review and Testing. The City's Representative will conduct Verification of Submitted Test Data, and otherwise direct testing and adjustment of this Work. These procedures may be performed at any hour of the day or night as required by the City's Representative to comply with the Project Schedule and avoid conflict with Residents. Provide all specified personnel and equipment at any time without claim for additional cost or time.
- B. Personnel: Provide services of the designated supervisor and additional technicians familiar with work of this Section. Provide quantity of technicians as required to comply with Project Schedule.
- C. In Addition, Provide:
 - 1. All tools appropriate for performance of adjustment of and corrections to this Work. Include spare wire and connectors and specified tooling for application.
 - 2. Ladders, scaffolding and/or lifts as required to access high devices.
 - 3. All test equipment.
 - 4. Complete set of latest stamped, actioned submittals of record for reference.
 - 5. Complete set of Test Reports.
 - 6. Complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.
 - 7. Demonstrate: Complete operation of all systems and equipment, including Portable Equipment.
 - 8. Adjust: As directed by the City's Representative.
 - 9. Correct: In timely manner, failure to comply with the Contract Documents, as reasonably determined by the City's Representative.
- D. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the City's Representative, in place of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven (7) days prior to the scheduled completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.

1.14 CLOSEOUT

- A. Punch List: Perform any and all remedial work, at no claim for additional cost or time. Where required, retest and submit Test Report. Notify the City's Representative of completion of Punch List.

- B. Portable Equipment: Furnish all portable equipment and spares to the City's Representative, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packing.
- C. Operating and Maintenance Data: Install framed operating and maintenance instructions. Submit Manuals.
- D. Project Record Documents: Submit print and digital copies. Digital files shall be in CAD system shall produce files in AutoCAD® .DWG format, latest version at time of bid.
- E. Keys: If applicable, replace construction locks with permanent locks. Provide 5 sets of keys to the City's Representative.
- F. Instruction: Conduct specified instruction.
- G. Warranty: Submit Warranty dated to run from date of Acceptance of the Work of this Section.

PART 2 PRODUCTS

2.01 GENERAL

- A. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.
- B. Each material, device or piece of equipment shall comply with all of the manufacturer's current published specifications for that item.
- C. Products shall be made by manufacturers regularly engaged in the production of such products.
- D. Provide quantity as shown on Contract Drawings, or as otherwise indicated.
- E. Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.
- F. Provide the manufacturer's latest design/model, permanently labeled with the manufacturer's name, model number and serial number.
- G. Where products are of similar type or use, provide products of the same manufacturer, unless otherwise indicated.
- H. Components
 - 1. UL or third party certified. Cabling and interconnecting hardware and components for telecommunications systems shall be UL listed or third party independent testing laboratory certified, and shall comply with NFPA 70 and conform to the requirements specified herein.
 - 2. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance.

- a. The label or listing by the specified organization will be acceptable evidence of compliance.
 - b. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the City's Representative.
 - c. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
3. Products shall provide a complete end-to-end system of connectivity and shall be warranted as a system by the manufacturer.
- I. Enclosures:
 1. Provide steel frames and enclosures designed and wired to eliminate all induced currents.
 2. Make bolted connections with self-locking devices.
- J. Finishes: Any item or component of the Work of this Section which is visible shall comply with the following.
 1. Finishes noted or scheduled on the Contract Drawings take precedence.
 2. Where design location requires that products, materials or equipment are visible to the public, no manufacturer's logos larger than 1/2 inch shall be visible. Unless otherwise noted or directed, neatly remove or permanently paint out such logos.
 3. Where finishes are not noted or otherwise defined in the Contract Documents, submit manufacturer's standard finish samples for selection by the City's Representative.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine existing conditions before starting work. Submit conflicts in a timely manner for resolution

3.02 PREPARATION

- A. Prepare and sequence the work to minimize disruption to each room environment and existing communications systems.
- B. Protection: Cover all computers, electronic equipment, desks, chairs, furniture and other articles when working at ceiling level and/or performing dust producing tasks.

3.03 REPAIR AND RESTORATION

- A. Where working in spaces occupied by the City, return to their original positions any furniture or articles relocated to perform the work.

3.04 CLEANING

A. Where working in spaces occupied by the City:

1. Immediately after completing work within each space, clean up and remove all materials, scrap and dust.
2. All scrap material in work area shall be picked up and removed from the building at the end of each day. See also Section 01 70 00 – Execution and Closeout Requirements for additional requirements.
3. All dust resulting from work performed shall be vacuumed up daily.
4. All scrap material shall be removed from site and disposed of in an authorized disposal site. Refer to Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION

SECTION 27 05 26

GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Section includes grounding and bonding of Communications Work, including but not limited to:
 - 1. Communications Raceways
 - 2. Cable Runway
 - 3. Cable Shields
 - 4. Cabinets and enclosures.
- B. Related Work Under Other Sections
 - 1. Related Sections:
 - a. Section 27 05 00 – Common Work Results for Communications
 - b. Section 27 05 29 – Hangers and Supports for Communications Systems
 - c. Section 27 05 33 – Conduits and Backboxes for Communications Systems
 - d. Section 27 05 36 – Cable Trays for Communications Systems
 - e. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
 - f. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
 - g. Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - h. Section 27 11 23 – Communications Cable Management
 - i. Section 27 15 00 – Communications Horizontal Cabling

1.02 SYSTEM DESCRIPTION

- A. Provide telecommunications system grounding conductor as described herein and indicate on drawings.
- B. Except as otherwise indicated, the complete communications installation including the metallic conduits and raceways, cable trays, boxes, cabinets and equipment shall be completely and effectively grounded in accordance with all code requirements, whether or not such connections are specifically shown or specified.
- C. Resistance:
 - 1. Resistance from the farthest ground bus through the ground electrode to earth shall not exceed 5 Ohms or the requirements of ANSI-J-STD-607-A-2002, whichever is more restrictive.

1.03 REFERENCES

- A. American National Standards Institute (ANSI)

1. ANSI/TIA/EIA-606-B-2016 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
2. ANSI/TIA-607-D-2019 Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
3. Underwriters Laboratories (UL)
4. UL 467 (1993); R 2004 Grounding and Bonding Equipment

1.04 SUBMITTALS

- A. Conform Section 27 05 00 Common Work Results for Communications.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
 1. Ground Rod:
 - a. High strength high carbon steel, with electrolytically bonded jacket of copper on surface
 - b. UL spec. 467
 - c. ANSI C-33.8-1072.
 - d. Manufacturer:
 - 1) Allied Bolt
 - 2) Inwesco 12A60
 - 3) Blackburn
 - 4) Cooper Power Systems
 - 5) Weaver.
 - 6) Erico "Cadweld" Products, Inc.
 - 7) ITT Blackburn.
 - 8) Or equal.
 2. Ground Wells:
 - a. Christy Concrete Products, Inc.
 - b. Forni Corp.
 - c. Or equal.
 3. Ground Bushings, Connectors, Jumpers and Bus:
 - a. O-Z/Gedney.
 - b. Thomas & Betts Corp.
 - c. Or equal.
 4. Compression Connector Lug
 - a. Panduit
 - b. B-Line SB-479 Series
 - c. Thomas & Betts
 - d. Or equal.

5. Telecommunications Ground Bus Bar
 - a. Description:
 - 1) Meets EIA/TIA 607.
 - 2) Provide compression-type lugs.
 - 3) Material:
 - a) ASTM A36 structural steel.
 - b) ASTM B187-C11000 copper bar.
 - c) Polyester resin fiberglass insulator.
 - d) Steel – Yellow Finish.
 - e) At least 20 inches wide.
 - f) Wall Mountable.
 - b. Manufacturer:
 - 1) B-Line SBTMGB20
 - 2) CPI 40153-020
 - 3) Or Equal.
6. Rack and Cabinet Grounding
 - a. Panduit Structured Ground Kit
 - b. Chatsworth Products Inc.
 - c. or equal.
7. Bonding Ribbon:
 - a. Annealed solid copper 3/8 inch wide x 1/16 inch thick, tin plated.
 - b. Manufacturer:
 - 1) Inwesco 12A55
 - 2) Corning Cable Systems
 - 3) Preformed Line Products.
 - 4) or equal.
8. Bonding Ribbon Clamp:
 - a. Soft lead
 - b. 1/16 inch thick
 - c. Bolt hole for attachment
 - d. Manufacturer:
 - 1) Inwesco 12A56
 - 2) Corning Cable Systems
 - 3) Preformed Line Products.
 - 4) Or equal.
9. Fargo Clamp:
 - a. Cast copper, silver plated, furnished with copper bolt.
 - b. RUS Listed
 - c. Manufacturer:
 - 1) Allied Bolt
 - 2) Inwesco 12A57
 - 3) Corning Cable Systems
 - 4) or equal.
10. Ground Inserts:
 - a. Cast Bronze w 1/4 Copper Rod.
 - b. Provide minimum one each maintenance hole or vault.
 - c. Manufacturer:
 - 1) Inwesco 12H69

- 2) or equal by vault or manhole manufacturer.
- 3) or equal.

2.02 GROUND CONDUCTORS

A. General purpose insulated:

1. NRTL listed and code sized copper conductor, with dual rated THHN/THWN insulation, color solid green. The jacket may have a yellow stripe.
2. The jacket shall include markings that indicate conductor, manufacturer, and NRTL listing.
3. Minimum wire size is #6 AWG UON. Grounding conductors larger than 4 AWG (5 mm) shall be stranded. Use solid conductors for 4 AWG (5 mm) and smaller.
4. Use stranded grounding conductors at locations subject to vibration or repeated flexing, regardless of size.
5. Where continuous color-coded conductors are not commercially available, provide a minimum 4 in. long color band with green, non-aging, plastic tape in accordance with NEC. The band shall be located within 152 mm (6 in.) of each termination and splice and at 1.2 m (4 ft.) intervals along its run.
6. Plenum rated, if run in plenum spaces.

B. Telecommunications Bonding Backbone (TBB)

1. A TBB shall be provided between the TMGB and each TGB.
2. The TBB shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 168 kcmil (No. 3/0 AWG; 12 mm).

C. Bonding Conductor for Telecommunications (BCT)

1. A BCT shall be provided between each TMGB and the building's service equipment (power) ground.
2. The BCT shall be the same size as, or larger than, the largest TBB.

D. Rack Bonding Conductor (RBC)

1. A separate RBC shall be provided between each cabinet or rack and the TGB or TMGB in the room.
2. Each RBC shall be sized as a 6 AWG (4 mm).

E. Unit Bonding Conductor (UBC)

1. Separate UBCs shall be provided for each piece of active equipment in a rack/cabinet that has a ground connection point separate from its power source.

2. The UBCs shall be connected between the active equipment and the RGB of the cabinet/rack.
3. The UBC shall be a minimum 12 AWG (2 mm).

F. Bonding Jumpers

1. Bonding jumpers shall be used wherever two metallic parts meet in an electrically insecure connection. Examples include, without limitation, cable tray sections and cabinet or rack components and doors.
2. Bonding jumpers shall be factory pre-terminated.

G. Outside Plant Applications

1. Grounding conductors shall be bare copper, meeting ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

H. Bonding pigtails: Insulated copper conductor, identified green, sized per code, and provided with termination screw or lug. Provide solid conductors for #10 AWG or smaller and stranded conductors for #8 AWG or larger.

2.03 COMPRESSION CONNECTOR LUG

A. Description

1. Connector lug with compression connection to conductor.
2. Copper alloy body.
3. Provide lug size to match conductor being terminated.
4. Provide 2 hole pattern lugs.
5. Provide each lug with silicon bronze hardware, including 2 bolts, 2 split lock washers and 2 nuts.

2.04 INSULATED GROUNDING BUSHINGS

- A. Plated malleable iron or steel body with 150 degree Centigrade molded plastic insulating throat and lay-in grounding lug.

2.05 CONNECTIONS TO PIPE

- A. For cable to pipe: UL listed bolted connection complying with CEC requirements.

2.06 CONNECTIONS TO STRUCTURAL STEEL, GROUND RODS, OR SPLICES

- A. Where required by the Drawings or Specifications, grounding conductors shall be spliced together, connected to ground rods or connected to structural steel using exothermic welds or high pressure compression type connectors.

- B. Exothermic welds shall be used for cable-to-cable and cable-to-ground rod and for cable to structural steel surfaces. Exothermic weld kits shall be as manufactured by Cadweld, Thermoweld or equal. Each particular type of weld shall use a kit unique to that type of weld.
- C. High-pressure compression type connectors shall be used for cable-to-cable and cable-to-ground rod connections. Connections shall be as manufactured by Thomas & Betts #53000 series, Burndy "Hy-Ground" or equal.

2.07 EXTRA FLEXIBLE, FLAT BONDING JUMPERS

- A. Where required by the drawing or specified herein.

PART 3 EXECUTION

3.01 GENERAL

- A. Provide Grounding and Bonding according to the most restrictive requirements of:
 - 1. ANSI-J-STD-607-B-2011.
 - 2. California Electrical Code Article 250 and references therein.
 - 3. California Electrical Code Article 800.
- B. In the event of conflicting requirements, California Electrical Code requirements shall prevail.

3.02 BONDED COMPONENTS:

- A. Bonding conductors or jumpers are to be installed within each Telecommunications Space between the TMGB/TGB and the following components:
 - 1. The communications building entrance protectors.
 - 2. Metallic shielding of outside cable plant.
 - 3. Metallic shielding of inside cables, where required by Code.
 - 4. Electrical panel board (if in the same room as TMGB/TGB).
 - 5. Building steel (if accessible in the same room as TMGB/TGB or close by external to the room).
 - 6. Telecommunications ladder rack and cable tray.
 - 7. Telecommunications equipment racks and cabinets via the RGBs.
 - 8. Wall-mounted metallic enclosures.
 - 9. Metallic conduit longer than 1 m (3 ft.) and not secured to a grounded enclosure in an electrically continuous manner.

10. Access floor systems.

- B. Where a metallic raceway connects two or more Telecommunications Spaces, bond to the Telecommunications Ground Busbar at each end
- C. Point of Connection
 - 1. Under Work of this Section, make connections to Communications Ground Busbars provided under Work of Division 26, or by separate project, as applies.
- D. Grounding Busbars
 - 1. Install busbars per manufacturer's instructions and at locations shown on the plans. If locations are unclear, apply for and conform to direction from the University's Representative.
 - 2. Locate all busbars so that they are accessible to telecommunications personnel, yet not exposed to casual contact. Other cable types must not be allowed to contact the busbars or pass within 152 mm (6 in.) of the busbar.
 - a. TMGBs and TGBs shall be located on or near the wall opposite the entrance, at least 2.1 m (7 ft.) above finished floor (AFF).
 - b. RGBs shall be located on the rear of the cabinet/rack. Horizontal RGBs shall be as near the top of the rails as space allows. Vertical RGBs shall be used only in closed cabinets.
- E. TMGB
 - 1. The TMGB shall be bonded directly to the closest point of the building's earth grounding electrode system and to building steel. Building steel should be tested to verify its ground conductivity to earth.
 - 2. All metallic raceways for telecommunications cabling located within the same room or space as the TMGB shall be bonded to the TMGB.
 - 3. Insulate the TMGB 51 mm (2") from the wall.
 - 4. For outside plant cables entering a building with a cable shield isolation gap, bond the cable shield (on the building side of the gap) to the TMGB. Outside plant protectors shall be bonded to the TMGB with a No. 4 AWG (5 mm) conductor.
 - 5. Connections to the busbar shall be made with 2-hole lugs.
 - 6. Connections shall be made by cleaning the area of connection on the busbar and on the two-hole lug and then applying a thin coating of anti-oxidant compound.
- F. TGB
 - 1. The TGB shall be bonded directly to the TMGB and to building steel. Building steel should be tested to verify its ground conductivity to earth.
 - 2. All metallic racks, cabinets, enclosures and raceways for telecommunications cabling located within the same room or space as the TGB shall be bonded to the TGB.

3. Insulate the TGB 51 mm (2") from the wall.
4. Connections to the busbar shall be made with 2-hole lugs.
5. Connections shall be made by cleaning the area of connection on the busbar and on the two-hole lug and then applying a thin coating of anti-oxidant compound.

G. RGB

1. An RGB shall be installed on/in all racks and cabinets.
 - a. The paint or other coating of the cabinet/rack shall be removed and the bare metal cleaned around each point where the RGB contacts the cabinet/rack.
 - b. A thin coating of anti-oxidant compound shall then be applied to the contact points before the RGB is bolted down.
 - c. The mounting screws should be of the thread-forming type, not self-tapping or sheet metal screws, if possible.
2. Each RGB shall be bonded to the TGB or TMGB in the same room with a dedicated RBC.
 - 1) Each piece of active equipment in a rack/cabinet that has a ground connection point separate from its power source shall be bonded to the RGB.

H. Routing

1. Bonding conductors shall be routed in as direct a route as possible to the point of termination while adhering to the following: No bonding conductor shall vertically traverse a wall except at wall corners.
2. Must not be daisy-chained among equipment, racks or pathways.
3. Shall have no twists, loops or sharp bends. Conductors shall be routed with smooth wide bends.
4. Should not be spliced. When necessary, use an approved Listed connection and position it in an accessible location.
5. Must be protected from physical damage, by its location or with a non-metallic barrier.
6. Should not be placed in metallic conduit. If it is necessary to place grounding and bonding conductors in metallic conduit that exceeds 1 m (3 ft) in length, the conduit must be grounded at both ends to the same ground point as the conductor.
7. Jacketed conductors run in plenum spaces must be plenum rated.
8. The maximum current on any grounding conductor under normal operation should be less than 1A AC and 500mA DC.
9. Shall be sized per code, depending on the length.

I. Mechanical Connections

1. Except where a manufacturer provided grounding lug is provided, the paint or other coating of the component (rack, cabinet, cable tray, etc.) shall be removed and the bare metal cleaned around each point where a conductor lug is connected.
2. A thin coating of anti-oxidant compound shall then be applied to the contact points before the lug is bolted down.
3. Mounting screws should be of the thread-forming type, not self-tapping or sheet metal screws.
4. Cable trays and conduit shall not be used as a grounding conductor, even if they are so rated.
5. Clean ground bars prior to terminating bonding conductors.
6. Torque threaded fasteners to manufacturer's recommended values.

J. Bonding Jumpers

1. Install manufacturer's bonding clips, plates or bonding jumpers:
2. Across the joint where sections of cable tray (mesh or ladder) meet.
3. Between a cabinet's door and its frame.
4. Between all other separate panels of a cabinet and the frame; such as the top, bottom & side panels and air ducting baffles.
5. Across all frame joints of cabinets and racks, unless the cabinet/rack is factory welded and fully assembled on arrival.

K. Cabinet and Rack Continuity

1. As an alternative to using jumpers across all separate parts and frame joints of a cabinet/rack, one of the following options may be used.
2. Remove the paint or other coating of both parts being joined to create a bare metal area at least the same diameter as the bolt head. Clean both bare metal areas and apply a thin coating of anti-oxidant compound before connecting the parts.
3. Use aggressive Type "B" internal-external tooth lock washers. Torque the bolts per manufacturer's instructions to create an acceptable bond. Two washers are necessary to accomplish this: one under the bolt head contacting and cutting paint and one under the nut.

L. Grounding Lugs

1. Wires shall be inserted to the full depth of the lug.
2. Space between wire insulation and the body of the compression lug shall be kept to a maximum of 3 mm (1/8 in.)

3. Lug must be sized with wire size.
4. To assure proper die is used with the specified connector, manufacturer's embossed coding systems shall be adhered to.
5. Connectors shall not be modified in any way.
6. Daisy chaining and stacking (piggy backing) of ground lugs is prohibited.
7. Bolts, nuts and washers used to secure ground connections shall match the diameter of the hole.
8. Make compression connections with the lug or fitting manufacturer's recommended tooling, with the tooling set to the recommended force and stroke.

M. Cable Tray and Cable Runway

1. Coordinate with the Work of Section 27 05 36 – Cable Trays for Communications Systems
2. Provide manufacturer's bonding clips, plates or jumpers as required to comply with the UL Classified conditions for use as an equipment grounding conductor.
3. Bond the Cable Runway to the Communications Ground Busbar at the Communications Room served.

N. Cable Shields

1. Comply with California Electrical Code Article 800.

O. Protector Fields

1. Comply with California Electrical Code Article 800.

P. Emergency/Information Telephone enclosures

1. Bond as detailed on Communications Drawings.

Q. Communications Broadband Systems

1. Comply with California Electrical Code Article 820.
2. Ground Broadband passives as shown on Communications Drawings.

3.03 LABELING

- A. All labels shall be permanent, computer-generated and nonmetallic, printed with wording in high contrast to the background. Comply with Section 27 05 53 - Identification for Communications Systems.
- B. Each telecommunications bonding conductor shall be labeled as close as practicable to its point of termination in a readable position. Labels shall have:

1. The statement, "If this connector or cable is loose or must be removed, please call the building telecommunications manager".
 2. An identification label providing the source and destination of the grounding conductor.
 3. Conductors contained completely within one room need not have the source and destination label.
 4. Instead, label the busbar at each connection with the name of bonded equipment (rack, tray, etc.) connected at that point.
- C. The BCT, or the conduit containing it, shall be labeled:
1. At the TMGB with tag or adhesive label that states "Building Conductor for Telecommunications (BCT) to Main Electrical Service Ground Connection".
 2. At the main electrical service ground connection with tag or adhesive label that states "Building Conductor for Telecommunications (BCT) to Telecommunications Main Grounding Busbar (TMGB)".

3.04 TESTING

- A. All grounding connections shall be tested for continuity and resistance after installation but prior to substantial completion. The telecommunications contractor is to invite the University's Representative to witness a portion of this testing while it is being performed.
- B. The test performed shall use an earth ground resistance tester that is configured for a continuity test, otherwise known as a two-point test or a "dead earth" test. Tests shall be conducted between the electrical entrance ground and the TMGB as well as at each TGB. This resistance shall be less than 0.05 Ohms.

END OF SECTION

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SECTION 27 05 29

HANGERS AND SUPPORTS FOR COMMUNICATION SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the provision of communications supports and cable hook system as described in this specification, including but not limited to:
 - 1. Strut supports
 - 2. Cable Hooks (J-hooks)
 - 3. Beam clamps
 - 4. Concrete Fasteners
 - 5. Touch-Up Materials
 - 6. Conduit supports.
 - 7. Equipment supports.
 - 8. Fastening hardware.
- B. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
 - 1. Section 27 05 00 – Common Work Results for Communications
 - 2. Section 27 05 26 – Grounding and Bonding for Communications Systems
 - 3. Section 27 05 33 – Conduits and Backboxes for Communications Systems
 - 4. Section 27 05 36 – Cable Trays for Communications Systems
 - 5. Section 27 05 53 – Identification for Communications Systems
 - 6. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
 - 7. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
 - 8. Section 27 11 23 – Communications Cable Management
 - 9. Section 27 15 00 – Communications Horizontal Cabling

PSB – Detention Area Automation Upgrades	City of Berkeley

1.02 SYSTEM DESCRIPTION

- A. Provide devices specified in this Section and related Sections for support of communications equipment specified for this Project.
- B. Provide support systems that are adequate for the weight of equipment, conduit and wiring to be supported.

1.03 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI/TIA/EIA-568-C.1-2009 Commercial Building Telecommunications Cabling Standard
 - 2. ANSI/TIA-569-C-2012 Telecommunications Pathways and Spaces
- B. National Fire Protection Association
 - 1. NFPA 70, National Electrical Code

1.04 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

1.05 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Cable hooks shall be listed and labeled by Underwriters Laboratories (UL) as required.
- C. Cable hooks shall have the manufacturers name and part number stamped in the part itself for identification.

PART 2 PRODUCTS

2.01 SUPPORTING DEVICES

- A. General
 - 1. Supports to be sized to suit load and selected to match mounting conditions
- B. Manufacturers
 - 1. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
 - 2. Concrete fasteners:
 - a. Phillips "Red-Head".
 - b. Remington.
 - c. Ramset.
 - d. Hilti

- e. Simpson Strong-Tie
 - f. or equal.
- 3. Concrete inserts and construction channel:
 - a. Unistrut Corp.
 - b. GS Metals "Globe Strut."
 - c. Thomas & Betts "Kindorf" Corp.
 - d. Or equal.
- 4. Conduit straps:
 - a. O-Z/Gedney.
 - b. Erico "Caddy" Fastening Products.
 - c. Thomas & Betts "Kindorf" Corp.
 - d. Or equal.
- 5. Beam Clamps
 - a. Cooper B-Line
 - b. SuperStrut
 - c. Unistrut
 - d. or equal
- 6. Aircraft Cable Sway Braces
 - a. Mason Industries
 - b. M.W. Sausse/Vibrex
 - c. Loos & Company, Inc.
 - d. or equal.
- C. Concrete Fasteners
 - 1. Provide expansion-shield type concrete anchors.
 - 2. Provide powder driven concrete fasteners with washers. Obtain approval by Owner's Representative prior to use.
- D. Concrete Inserts
 - 1. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of ¼ inch to ½ inch diameter thread for rod support.
- E. Aircraft cable sway braces
 - 1. Steel rope sized to meet load.
- F. Construction Channel:
 - 1. Construction:
 - 2. 1-5/8" square galvanized channel formed from U.S.S.G No. 12 or 0.109 inch cold formed steel with 17/32-inch diameter bolt holes, and 1-1/2 inch on center in the base of the channel.
 - 3. 10 foot sections.

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4. All supporting materials by same manufacturer.

G. Beam Clamps

1. Malleable iron electro-galvanized steel beam clamps selected to match building structural steel members.

H. Conduit Straps

1. One hole strap, steel or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.
2. Use malleable strap with spacers for exterior and wet locations.
3. Use steel strap without spacers for interior locations.
4. Steel channel conduit strap for support from construction channel.
5. Steel conduit hanger for pendant support with threaded rod
6. Steel wire conduit support strap for support from independent #12 gauge hanger wires.

I. Threaded rods, couplings, screws and nuts:

1. Electrolytically coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.

J. Miscellaneous Parts

1. Hot dipped galvanized after fabrication; after cutting, de-burring and hole drilling. Coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.

K. Paint/Tape for Touch-up:

1. Zinc: CRC "Zinc-It", Glyptal, Enterprise Galvanizing "Galambra", or equal.

2.02 CABLE HANGERS

A. Ceiling Hung J-Hooks

1. Drawing Reference(s):
2. WMJ
3. ACJ
4. Features/Functions/Construction
5. Specifically intended to carry the load of up to 25 communications cables without applying excess forces to cables at bottom of bundle.
6. Integral broad bottom edge to spread cable load with flat bottom and provide a minimum of 1-5/8 inch cable bearing surface.

7. Integral hanger rod attachment hardware at top.
8. Load rated for application.
9. Incorporates smooth 90-degree radiused edges to prevent snagging cable jackets on installation.
10. Designed so the mounting hardware is recessed to prevent cable damage.
11. Integral mechanical cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable.
12. Suitable for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.
13. Multi-tiered cable hooks to be used where required to provide separate cabling compartments, or where additional capacity is needed.
14. Finishes:
 - a. Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.
 - b. Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.
15. Manufacturer
 - a. Cooper B-Line series BCH21, BCH32, BCH64, BCH-HBA.
 - b. Caddy/Erico CableCat
 - c. or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. The Owner's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

3.02 EXAMINATION

- A. Thoroughly examine site conditions for acceptance of supporting device installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.03 PREPARATION

- A. Coordinate size, shape and location of concrete pads required for equipment installation with Base Building General Contractor.
- B. Layout support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.
- C. Where shown on the Drawings or Specifications, install freestanding communications equipment on concrete pads.

3.04 INSTALLATION

- A. Furnish and install supporting devices as noted throughout the Communications Systems work.
- B. Communications device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.
- C. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using precast inserts, expansion anchors, preset inserts or beam clamps.
- D. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster or gypsum board partitions and walls.
- E. Use expansion anchors or preset inserts in solid masonry walls.
- F. Use self-drilling anchors, expansion anchor, or preset inserts on concrete surfaces.
- G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- H. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or acoustical ceiling suspension wires.
- I. Do not drill structural steel members unless first approved in writing by the Owner's Representative.
- J. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- K. Install surface-mounted cabinets with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.
- L. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

3.05 ERECTION OF METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

3.06 WOOD SUPPORTS

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

3.07 ANCHORAGE

- A. As part of the project submittals, the contractor to provide engineered shop drawings indicating the proposed design for mounting all work of this Division weighing more than 20 pounds, inclusive of mounting systems, and for equipment mounted at the exterior, inclusive of its effective wind load under the range of conditions experience.

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1. Shop drawings to be accompanied by anchorage calculations indicating that it shall remain attached to the mounting surface after experiencing seismic forces in conformance with CBC Sections 1613A and 1614A.
2. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.

3.08 DISTRIBUTION PATHWAY VIA CEILING HUNG CABLE HOOKS (J-HOOKS):

- A. Void, Plenum or Suspended Ceiling Exposed Cable Installation. Where drawings specifically show or permit use of exposed cable installation in voids, conform to the most restrictive requirements of Code, TIA-569-B and this Section.
- B. Provide support for all cabling. Do not place or attach directly to T-bar grid, concealed spline grid, flexible or rigid ductwork, HVAC registers, sprinkler piping or fixtures, light fixtures or building structure. Conform to the California Electric Code.
- C. Placement:
 1. All pathways created by ceiling hung cable hooks shall be reviewed by the Owner's Representative prior to installation.
 2. Ceiling hung cable hooks and cabling supported by same shall not obscure access to access doors, hatches, air dampers, valves, filter sections, VAV boxes, cable trays, junction boxes, pull boxes or similar areas of access required by other trades.
 3. All ceiling hung cable hooks shall be mounted close enough together such that upon completion of the station cable installation a minimum amount of cable droop occurs between adjacent rings. The distance between supporting rings shall not exceed 48 inches or as required by the current edition of TIA-569-B.
 4. Refer to the separation requirements listed in Section 27 15 00 – Communications Horizontal Cabling for minimum distances from electrical power and other electro-magnetic sources.
 5. All cable hook pathways shall be dedicated for use by voice/data cabling. Any cables required for other low voltage systems shall be routed with a separate suspension system.

END OF SECTION

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SECTION 27 05 33
CONDUITS AND BACKBOXES FOR COMMUNICATIONS SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK:

- A. Provide telecommunications pathways in accordance with EIA TIA/EIA-569-B, as specified in this Section and as shown on the plans. Provide system furniture pathways in accordance with UL 1286. Provision of all low voltage Communications Systems Pathway and Electronic Security and Safety System Pathway, including:
 - 1. Rigid steel conduit and fittings.
 - 2. PVC insulated rigid steel conduit and fittings.
 - 3. Intermediate metal conduit and fittings.
 - 4. Electrical metallic tubing and fittings.
 - 5. Flexible metallic conduit and fittings.
 - 6. Liquidtight flexible metallic conduit and fittings.
 - 7. Miscellaneous conduit fittings and products.
 - 8. Junction Boxes
 - 9. Hinged cover enclosures.
 - 10. Pullboxes and Terminal Cabinets.
- B. At Hazardous Occupancies, installation conforms to the requirements of California Electric Code for Class and Division rating of spaces.
- C. All conduits and suspension system for conduits for communications cabling shall be dedicated for voice/data cable routing, and shall not be shared with any other cabling system.

1.02 RELATED WORK IN OTHER SECTIONS:

- A. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
 - 1. Section 27 05 00 – Common Work Results for Communications.
 - 2. Section 27 05 26 – Grounding and Bonding for Communications Systems
 - 3. Section 27 05 29 – Hangers and Supports for Communications Systems

4. Section 27 05 36 – Cable Trays for Communications Systems
5. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
6. Section 27 13 00 – Communications Interior Backbone Cabling
7. Section 27 15 00 – Communications Horizontal Cabling

1.03 REFERENCES

- A. Usage: In accordance with Section 01 11 00 – Summary of Work.
 1. American National Standards Institute (ANSI)
 - a. ANSI C80.1 1994 Rigid Steel Conduit - Zinc Coated
 - b. ANSI C80.3 1991 Electrical Metallic Tubing - Zinc Coated
 2. National Electrical Manufacturers Association (NEMA)
 - a. NEMA 250-2003 Enclosures for Electrical Equipment (1000 Volts Maximum)
 - b. NEMA FB 1 (ANSI/NEMA FB 1-2003) Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
 3. Underwriters Laboratories, Inc. (UL)
 - a. UL 1 2000 Flexible Metal Conduit
 - b. UL 6 2004 Electrical Rigid Metal Conduit - Steel
 - c. UL 50 (1995; R 1999, Bul. 2001) Enclosures for Electrical Equipment

1.04 SUBMITTALS

- A. Conform with Section 27 05 00 - Common Work Results for Communications.

1.05 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Only products and applications listed in this Section may be used on the project unless otherwise submitted and approved by the Owner's Representative.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide the following types of conduit systems listed by their commonly used generic name.

2.02 RACEWAY

- A. Manufacturers:
 1. Raceway:
 - a. Allied Tube and Conduit Co.
 - b. Triangle PWC, Inc.
 - c. Western Tube and Conduit Corp.

- d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Alfex Corp.
 - g. American Flexible Metal Conduit Co.
 - h. Anaconda.
 - i. Or equal.
 - 2. Fittings:
 - a. Appleton Electric Co.
 - b. OZ/Gedney.
 - c. Thomas & Betts Corp.
 - d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Carlon.
 - g. or equal.
- B. Rigid Steel Conduit.
- 1. Drawing and Spec Reference: RSC.
 - 2. Construction:
 - a. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.
 - b. Standard threaded couplings, locknuts, bushings, and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure.
 - c. Three piece couplings: Electroplated, cast malleable iron.
 - d. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150 degree C minimum.
 - e. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.
 - f. Insulated metallic bushings: Threaded cast malleable iron body with plastic insulated throat rated 150 degrees C.
 - g. All fittings and connectors shall be threaded.
- C. Coated Rigid Steel Conduit:
- 1. Drawing and Spec Reference: CRSC.
 - 2. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and NEMA RN-1 with nominal 40 mil thermoplastic vinyl coating, heat fused and bonded to the exterior of the conduit.
 - 3. Fittings:
 - a. Conduit couplings and connectors shall be as specified for galvanized rigid steel conduit and shall be factory PVC coated with an insulating jacket equivalent to that of the coated material.
 - b. Fittings over-sleeve to extend 1 conduit diameter or 1-1/2" beyond fitting, whichever is less.
 - 4. Performance:
 - a. Tensile Strength: 3500 psi.

5. Approvals:
 - a. NEMA RN1 (Type 40 - 40 mils thick)
 - b. CalTrans Type 2
6. Manufacturers:
 - a. Plastibond by RobRoy Industries.
 - b. Occal-40 by Occidental Coating Company.
 - c. KorKap by Plastic Applicators.
 - d. Ocal-Blue
 - e. or equal.

D. Intermediate Metal Conduit

1. Drawing Reference: IMC
2. Conduit: Hot dip galvanized steel meeting the requirements of CEC Article 345 and conforming to ANSI C80.6 and UL 1242.
3. Fittings: Conduit couplings, connector and bushing shall be as specified for galvanized rigid steel conduit. Integral retractable type IMC couplings are also acceptable.

E. Electrical Metallic Tubing.

1. Drawing and Spec Reference: EMT.
2. Conduit: Shall be formed of cold rolled strip steel, electrical resistance welded continuously along the longitudinal seam and hot dip galvanized after fabrication. Conduit shall conform to ANSI C80.3 specifications and shall meet UL classifications.
3. Set screw type couplings: Electroplated, steel or cast malleable iron, UL listed concrete tight. Use set screw type couplings with four setscrews each of conduit sizes over 2 inches. Setscrews shall be of case hardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding.
4. Set screw type connectors: Electroplated steel or cast malleable iron UL listed concrete tight with male hub and insulated plastic throat, 150 degree C temperature rated. Setscrew shall be same as for couplings.
5. Raintight couplings: Electroplate steel or cast malleable iron; UL listed raintight and concrete tight, using gland and ring compression type construction.
6. Raintight connectors: Electroplated steel or cast malleable iron, UL listed raintight and concrete tight, with insulated throat, using gland and ring compression type construction.

2.03 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS

A. General

1. UL 514B.
2. Listed in UL Electrical Construction Materials List.

B. Conduit Fittings, Insulated Throat Grounding Bushings

1. Description
 - a. Threaded for Rigid Steel Conduit and Intermediate Metal Conduit.
 - b. UL Listed for use with copper conductors.
 - c. Thermoplastic insulated liner for 105 degrees Celsius.
 - d. Body of malleable iron, zinc plated; or die cast zinc.
2. Manufacturer
 - a. Thomas & Betts (Steel City) BG-801 Series
 - b. O-Z/Gedney
 - c. or equal.
- C. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.
- D. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.
- E. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.
- F. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling shall accommodate .75-inch deflection, expansion, or contraction in any direction, and allow 30-degree angular deflections. Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber jacket and stainless steel jacket clamps. Unit shall comply with UL467 and UL514.
 1. Manufacturer:
 - a. OZ/Gedney Type DX
 - b. Steel City Type EDF
 - c. or equal.
- G. Fire rated penetration seals:
 1. UL classified.
 2. Conduit penetrations in fire rated separation shall be sealed with a UL classified assembly consisting of fill, void or cavity materials.
 3. The fire rated sealant material shall be the product best suited for each type of penetration, and may be a caulk, putty, composite sheet or wrap/strip.
 4. Penetrations of rated floors shall be sealed with an assembly having both F and T ratings at least equal to rating of the floor.
 5. Penetrations of rated walls shall be sealed with an assembly having an F rating at least equal to the rating of the wall.
- H. Standard products not herein specified:

1. Submit for review a listing of standard electrical conduit hardware and fittings not herein specified prior to use or installation, i.e. locknuts, bushings, etc.
2. Listing shall include manufacturers name, part numbers, and a written description of the item indicating type of material and construction.
3. Miscellaneous components shall be equal in quality, material, and construction to similar items herein specified.

I. Hazardous area fittings: UL listed for the application.

2.04 JUNCTION AND DEVICE BOXES

A. 5" Square Junction Box

1. Drawing References: As indicated on Symbol Schedule
2. Construction
 - a. 5 in. Square x 2.875 in. Deep Metal backbox with an integral cable management system.
 - b. Use on Class 2 and Class 3 Remote-Control, Signaling and Power-Limited Circuits only.
3. Manufacturer
 - a. Randl Industries, Inc. 5 Square Telecommunications Outlet Box T-55017 with D-51G000 one gang ring.
 - b. Or equal.

2.05 CABINETS AND ENCLOSURES

A. Terminal Cabinets:

1. Drawing Reference: As Scheduled.
2. Construction:
 - a. Zinc Coated Sheet Steel, code gauge with standard concentric knockouts for conduit terminations.
 - b. Interior dimensions not less than those scheduled.
 - c. Finish: Manufacturer's standard gray baked enamel finish.
 - d. Covers: Trim fitted, continuous hinged steel door, flush catch – lockable and keyed to match. Screw fastened doors not acceptable.
 - 1) Door face to be not less than 95% of panel interior dimensions.
 - e. Provide with 3/4" fire retardant treated ply backboard.
3. Mounting:
 - a. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - b. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.
 - c. Interior Applications:
 - 1) NEMA 250 Type 1, unless otherwise noted. Refer to plans and schedules.
 - d. Exterior Applications:
 - 1) NEMA 250 Type - As Scheduled, not less than NEMA 3R.

4. Manufacturers:
 - a. B-Line Electrical Enclosures
 - b. Circle AW Products.
 - c. Hammond
 - d. Henessey.
 - e. Hoffman.
 - f. Myers Electric Products
 - g. Rittal.
 - h. or equal.

PART 3 EXECUTION

3.01 CONDUIT APPLICATION

- A. General: Install the following types of conduits and fittings in the locations listed, unless otherwise noted in the drawings:
 1. Exterior, Exposed:
 - a. Type RSC for applications up to 8 feet AFF or to first pull box, whichever is first, applications subject to physical abuse or for applications greater than 4" diameter.
 2. Interior, Exposed, Wet and Damp Locations:
 - a. Type RSC.
 - b. At interior locations over 8 feet above finished floor, EMT acceptable.
 3. Interior, Hazardous Locations
 - a. Type RSC
 - b. Type IMC, where permitted by the CEC.
 4. Interior, exposed or concealed, dry locations:
 - a. RSC, if subject to physical abuse.
 - b. EMT, if not subject to physical abuse.
 5. Interior, concealed, damp locations, including in masonry walls.
 - a. RSC
 6. Embedded in Concrete
 - a. RSC or rigid non-metallic conduit.
 - b. PVC Type DB-120.
 7. Transition from walls to open plan furniture systems:
 - a. Liquidtight

3.02 GENERAL REQUIREMENTS

- A. Refer to the manufacturer's instructions and conform thereto.
- B. Distribution Pathway via EMT Raceway:
 1. The EMT conduit is to be installed meeting the NEC handbook Article 348 Installation Specifications.

2. Provide escutcheon plates for all through wall conduit stubs.
3. All ends of conduits shall be cut square, reamed and fitted with insulated bushing.
4. All conduit which passes through fire walls shall be sealed with fire stop putty after all station wire has been installed.

3.03 MOUNTING AND INSTALLATION – DEVICE BOXES

- A. Conform to the more restrictive of NEMA OS 3-2002 and the following.
- B. Provide backboxes at all communications systems devices. Installation of device plates directly to wall surface without use of a backbox, unless specifically directed on plans, is unacceptable.
- C. The distance between pull boxes shall not exceed 150 feet or more than two 90 degree bends.
- D. Align boxes plumb with floor and surrounding construction. At door frames, locate 4" from frame. Verify placement with Owner's Representative details to ensure that box clears all trim, etc.
- E. Support and fasten boxes securely. At stud walls use rigid bar hangers, attached to hanger with stud and nut.
- F. At existing locations, provide cutting, patching and finishing as required to maintain or restore finishes so that resulting installation is integrated into the Architectural decor of the particular location.
- G. Mounting Height: the mounting height of a wall-mounted outlet box is defined as the height from the finished floor to the horizontal center line of the cover plate.
- H. Mount outlet boxes with the long axis vertical. Three or more gang boxes shall be mounted with the long axis horizontal.
- I. Install wiring jacks and outlet devices only in boxes which are clean; free from excess building materials, dirt, and debris.
- J. Install wiring jacks and outlet devices after wiring work is complete.

3.04 TERMINAL CABINETS, JUNCTION BOXES AND PULL BOXES

- A. General
 1. Thoroughly examine site conditions for acceptance of cabinets and enclosures installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.
- B. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.

- C. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with standards referenced in Section 27 05 29.
- D. "Train" interior wiring, bundle and clamp using specified plastic wire wraps. Separate power and signal wiring.
- E. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- F. Terminate conduit in cabinet with lock nut and grounding bushing.
- G. Cleaning
 - 1. Touch-up paint any marks, blemishes or other finish damage suffered during installation.
 - 2. Vacuum clean cabinet on completion of installation.

3.05 SUPPORT

- A. Provide supports for raceways as specified in Section 27 05 29 – Hangers and Supports for Communications Systems.
- B. All raceways installed in exposed dry locations shall be grouped in a like arrangement and supported by means of conduit straps, wall brackets or trapeze hangers in accordance with Code and the requirements of the this Section and Section 27 05 29 – Hangers and Supports for Communications Systems. Fasten all hangers from the building structural system.
- C. Provide supports and mounting attachments per the most restrictive of Code and the following.

Raceway Size (inches)	No of cables in run	Location	Support Spacing (feet)	
			RSC	EMT
Horizontal Runs				
½, ¾	1-2	Flat Ceiling Wall Runs	5	5
½, ¾	1-2	Where access limited to building structure	7	7
½, ¾	3≥	Any location	7	7
1≥	1-2	Flat ceiling or wall	6	6
1≥	1-2	Where access limited to building structure	10	10
1≥	3≥	Any locations	10	10
Any	Any	Concealed	10	10
Vertical Runs				
½, ¾	Any	Exposed	7	7
1, 1-1/4	Any	Exposed	8	8
1-1/2≥	Any	Exposed	10	10

- D. Install no more than one coupling or device between supports.
- E. Conduit support
 - 1. As specified in Section 27 05 29 – Hangers and Supports for Communications Systems

- F. The Owner's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

3.06 PENETRATIONS

- A. Gypsum Wall Board Penetrations: Provide circular penetrations maximum 1/8" inch larger than outer diameter of conduit being used. On both sides of the wall fill space between conduit and wall with joint compound, depth to match gypsum board thickness.
- B. Install UL listed fire-stop system whenever a raceway penetrates a firewall in conformance with the manufacturer's directions, the published systems assembly requirements, CBC Section 709 and 710 and CEC 300-21, whichever is the most restrictive. At cable tray penetrations, provide pillow type removable fire stop per CBC Section 709 and 710, the published systems assembly requirements and the manufacturer's directions, whichever is the most restrictive.
- C. All communications systems conduit openings in walls and floors are the responsibility of the Contractor. Install sleeves shown on the drawings when the concrete is poured. Any openings required after the concrete has set maybe core drilled.

3.07 RACEWAY INSTALLATION, GENERAL

- A. Raceway runs are shown schematically. Install concealed unless specifically shown otherwise. Supports, pull boxes, junction boxes and similar generally not indicated. Provide where designated.
1. Install exposed conduit and raceway parallel and perpendicular to nearby surfaces or exposed structural members, and follow the surface contours. Level and square conduit and raceway runs.
 2. Raceway runs shall be mechanically and electrically continuous between all each equipment rack and utility demarcation point, receptacle and/or surface raceway strip, as applies.
 3. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box, or outlet by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter.
 4. Bends
 - a. All bends or elbows shall have a minimum radius as follows:

Conduit Size	Min. Radius (Inches)
3/4"	8
1"	12
1-1/4"	18
2"	24
2-1/2"	24
3"	30
3-1/2"	30
4"	30
5"	36
6"	42

- b. Use factory elbows or machine bends for conduit bends 1-1/4" and larger.

5. Make bends and offsets so the inside diameter is not effectively reduced. Make bends in parallel or banked runs from the same center line so that the bends are parallel.
6. Install at least one (1) 3/8", 200 pound strength nylon pull cord in all empty raceways.
7. Raceways crossing building expansion joints or in straight runs exceeding 100 feet shall be provided with UL listed expansion fittings.
8. Install conduit seals and drains to prevent accumulated moisture in conduits from entering Communications System enclosures.
9. Conduit fill shall not exceed 40% of the conduit's cross-sectional area.
- B. Do not install conduit in concrete slabs unless specifically directed by Owner's Representative. Embedded conduits in concrete slab walls, and columns shall be installed in center third between upper and lower layers of reinforcing steel as directed by the Owner's Representative. Space conduits 8" on center except at cabinet locations where slab thickness shall be increased as directed by the Owner's Representative.
- C. All conduits to be kept 12" away from steam or hot water lines. Install horizontal conduit and raceway runs below water and steam piping.
- D. Conduit dropping down to equipment shall be as straight as possible without any offsets, parallel or perpendicular to walls, ceilings and other building features.
- E. Conduit installed on any equipment shall be run symmetrical with the equipment and in such a manner as to:
 1. not to be exposed to damage;
 2. not interfere with access to components of the equipment that will interfere with maintenance operation or;
 3. not to be in a manner that the Owner deems detrimental to its operation.
- F. Whenever an installation such as that listed occurs, the Contractor shall make all necessary changes at no additional cost to the Owner.
- G. All cut ends of conduit, scratches, tool marks, etc. on any metallic raceway installed in the ground or on the exterior of the building shall be treated with two coats of specified Touch Up Paint/Tape.
- H. Exposed conduit and metallic surface raceway installed in finished spaces shall be painted to match surrounding surfaces using paint and methods directed by the Owner's Representative.
- I. All raceways stubbing up into equipment or racks shall be sealed. Raceways with conductors shall be plugged with duct-seal. Spare raceways shall be capped. Prevent foreign matter from entering conduit and raceway; use temporary closure protection. Replace conduits containing concrete, varnish or other foreign material.
- J. Complete installation of conduit and raceway runs before starting installation of cables/wires within conduit and raceway.

- K. Use specified conduit and raceway fittings that are of types compatible with the associated conduit and raceway and suitable for the use and location. Join and terminate conduit and raceway with fittings designed and approved for the purpose of the conduit and raceway system and make up tight.
- L. Where chase nipples are used, align the raceway and coupling square to the box and tighten the chase nipple so no threads are exposed.
- M. Horizontal conduit or EMT runs, where required and permitted, shall be installed as close to ceiling or ceiling beams as practical.
- N. Conduit and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes or radiator branches.
- O. Conduit and EMT shall not be run through beams, purlins or columns except where permission is granted by Owner's Representative in writing.
- P. Bond installed metallic raceway in accordance with the requirements of the CEC.

END OF SECTION

SECTION 27 05 36

CABLE TRAYS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Cable Trays for Communications Cabling
 - 1. Cable Trays
 - 2. Cable Runways
- B. Cable Tray Support

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Section 27 05 00 – Common Work Results for Communications
- B. Section 27 05 26 – Grounding and Bonding for Communications Systems
- C. Section 27 05 29 – Hangers and Supports for Communications Systems
- D. Section 27 05 33 – Conduits and Backboxes for Communications Systems
- E. Section 27 05 53 – Identification for Communications Systems
- F. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- G. Section 27 15 00 – Communications Horizontal Cabling

1.03 REFERENCES

- A. Usage: In accordance with Section 01 11 00 – Summary of Work.
 - 1. National Electrical Manufacturers Association (NEMA)
 - a. NEMA FG 1 1-1998 Fiberglass Cable Tray Systems
 - b. NEMA VE 1 1-1998 Metal Cable Tray Systems.
 - c. NEMA VE 2 2001 Metal Cable Tray Installation Guidelines

1.04 SUBMITTALS

- A. Conform with Section 27 05 00 Common Work Results for Communications.

PART 2 PRODUCTS

2.01 CABLE TRAY AND CABLE RUNWAY

A. Cable Runway (To be installed at Server Room 1111)

1. Drawing and spec reference: CR*, where "*" denotes nominal width of cable runway in inches.
2. Construction:
 - a. Solid Steel Side Bar per ASTM A-36 or Tubular Steel Side Bar per ASTM A-513.
 - b. 1.5" x 0.375 minimum tubular side stringers.
 - c. UL Classified splice kits.
 - d. Designed to support at least 100 pounds per foot load with a Safe Working Load deflection of $\frac{1}{2}$ " or less.
3. Finish: Telco gray powder coat or gold on zinc plating.
4. Approvals:
 - a. ASTM A513
 - b. UL Classified as an equipment grounding conductor.
 - c. California Electrical Code, Article 318
5. Manufacturers:
 - a. B-Line Telecom-Saunders SB-17.
 - b. Chatsworth Products Inc. 11275 series.
 - c. PW Industries
 - d. or equal

B. Basket Cable Tray, Open Wire Frame

1. Drawing and spec reference(s): CTW xx-y , where xx denotes the tray width and y the depth of the tray, in inches.
2. Construction
 - a. Welded wire mesh with continuous safety edge wire lip.
 - b. Mesh forms grid at nominally 2" by 4"
 - c. Carbon Steel
 - d. Electroplated zinc galvanized
 - e. All bends, seams and joints field fabricated from basic straight section pieces and splice components as supplied by the manufacturer.
 - f. Provide a complete system of accessories, including bonding and grounding connections, conduit connectors, to terminate conduits extended to basket edge, radius shields to protect cabling at inside corners, and waterfall drop-outs at each end of cabling racks and cabinets indicated on the plans scheduled or indicated to terminate open wiring systems.
 - g. Provides pathway complying with ANSI/TIA-569C and NEMA Publications VE1 & VE2

- h. Meets requirements of National Electrical Code, Article 318
- 3. Approvals:
 - a. NEMA Publications VE1 & VE2
- 4. Manufacturers:
 - a. B-Line Wire Basket Runway
 - b. Cablofil

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Provide all required supports, fittings and accessories for a complete system as described in NEMA VE-2, by Code, manufacturer recommendation or as shown on the plans, whichever is most restrictive.
- B. Bond sections to one another and to building ground.
- C. Access Clearance. Maintain access for use by City's personnel to tray as described below. Coordinate installation with work of structural, mechanical, plumbing/fire protection and electrical trades to maintain required access.
 - 1. Unless shown otherwise on the plans, provide a clear access of at least 24" wide along one side of each tray for use by City's personnel.
 - 2. Unless shown otherwise on the plans, installation to maintain at least 12" vertical clearance over the top of each tray for use by City's personnel.

3.02 SUPPORT

- A. Support in accordance with the most restrictive of the following:
 - 1. Contractor's engineered means of engineered support submitted in accordance with the requirements of 27 05 00 – Common Work Results for Communications and Section 27 05 29 – Hangers and Supports for Communications Systems.
 - 2. California Building Code, including but not limited to requirements of Volume 2, Chapter 16, Division IV, Section 1632 and Table 16-O.
 - 3. Metallic Cable Tray: NEMA VE 2-2001, or latest edition
- B. Provide lateral sway bracing as required by Code.

END OF SECTION

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SECTION 27 05 53

IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

PART 1 GENERAL

1.01 SUMMARY:

- A. Provide all labor, materials, tools, and equipment required for permanent intelligible labeling on, or adjacent to, all cabling, connectors, innerduct, faceplates, jacks, receptacles, controls, fuses, circuit breakers, patching jacks, and racks.
- B. This section includes minimum requirements for the following:
 - 1. Labeling Communications Cabling
 - 2. Labeling Closet Hardware
 - 3. Labeling Work Stations
 - 4. Labeling Pathways, Spaces, Grounding and Bonding.
- C. Refer to detailed plans for additional requirements.
- D. Clearly and distinctly indicate the function of the item.
- E. Coordinate with Record Drawings

1.02 REFERENCES:

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM D 709(2001) Laminated Thermosetting Materials
- B. Electronic Industries Alliance (EIA)
 - 1. ANSI/TIA/EIA-606B (2016) - Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
- C. Underwriters Laboratories (UL)
 - 1. UL 969 (1995; R 2001) Marking and Labeling Systems

1.03 QUALITY ASSURANCE

- A. Identification and administration work specified herein shall comply with the applicable requirements of:
 - 1. ANSI/TIA/EIA-606-B-2016 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
 - 2. ANSI/TIA-569-C-2012 Telecommunications Pathways and Spaces

3. ANSI/TIA/EIA-568-C.1-2009 Commercial Building Telecommunications Cabling Standard.
4. BICSI Telecommunications Distribution Methods Manual, 13th Edition.
5. UL 969 (1995; R 2001) Marking and Labeling Systems.

1.04 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

PART 2 PRODUCTS

2.01 COMMUNICATION CABLING LABELS, INTERIOR

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Provide vinyl substrate with a white printing area and black print. If cable jacket is white, provide cable label with printing area that is any other color than white, preferably orange or yellow – so that the labels are easily distinguishable.
- D. Shall be flexible vinyl or other substrates to apply easy and flex as cables are bent.
- E. Shall use aggressive adhesives that stay attached even to the most difficult to adhere to jacketing.
- F. Manufacturers:
 1. Cable Type – Silver Satin
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
 - c. Hubbell
 - d. Leviton
 - e. Panduit.
 - f. or equal.
 2. Cable Type – 4 pair UTP
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
 - c. Hubbell
 - d. Leviton
 - e. Panduit.
 - f. or equal.
 3. Cable Type – 4 pair STP
 - a. Brady TLS2200 labels – PTL-21-427
 - b. Brady Laser tab labels – LAT-19-361
 - c. Hubbell
 - d. Leviton

- e. Panduit.
- f. or equal.
- 4. Cable Type – 25 pair copper
 - a. Brady TLS2200 labels – PTL-21-427
 - b. Brady Laser tab labels – LAT-19-361
 - c. Panduit.
 - d. or equal.
- 5. Cable Type – 50 pair copper
 - a. Brady TLS2200 labels – PTL-33-427
 - b. Panduit.
 - c. or equal.
- 6. Cable Type – 100 pair copper
 - a. Brady TLS2200 labels – PTL-34-427
 - b. Brady
 - c. Panduit.
 - d. or equal.
- 7. Cable Type – 2 strand fiber
 - a. Brady TLS2200 labels – PTL-19-427
 - b. Brady Laser tab labels– LAT-17-361
 - c. Panduit.
 - d. or equal.
- 8. Cable Type – 4-12 strand fiber
 - a. Brady TLS2200 labels – PTL-21-427
 - b. Brady Laser tab labels – LAT-19-361
 - c. Panduit.
 - d. or equal.
- 9. Cable Type – RG-6 Coax
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels –LAT-18-361, LAT-53-361
 - c. Panduit.
 - d. or equal.
- 10. Cable Type – RG-59 Coax
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
 - c. Panduit.
 - d. or equal.
- 11. Cable Bundles
 - a. Brady TLS2200 labels – PTL-12-109
 - b. Panduit.
 - c. or equal.

2.02 COMMUNICATIONS CABLE LABELS, OUTSIDE PLANT

A. Cable Tags in Manholes, Handholes, and Vaults

1. Provide tags for communications cable or wire located in manholes, handholes, and vaults.
 - a. The tags shall be polyethylene.
 - b. Machine printed - Do not provide handwritten letters.
2. Polyethylene Cable Tags
 - a. Provide tags of polyethylene that have an average tensile strength of 3250 pounds per square inch; and that are 0.08 inch thick (minimum), non-corrosive non-conductive; resistive to acids, alkalis, organic solvents, and salt water; and distortion resistant to 170 degrees F.
 - b. Provide 0.05 inch (minimum) thick black polyethylene tag holder.
 - c. Provide a one-piece nylon, self-locking tie at each end of the cable tag.
 - d. Ties shall have a minimum loop tensile strength of 175 pounds. The cable tags shall have black block letters, numbers, and symbols one inch high on a yellow background.
 - e. Letters, numbers, and symbols shall not fall off or change positions regardless of the cable tags' orientation.
3. Manufacturers:
 - a. Panduit
 - b. Brady
 - c. or equal.

2.03 CLOSET HARDWARE LABELS

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Where insert type labels are used provide clear plastic cover over label.
- D. Manufacturer:

1. Copper Patch Panels
 - a. 4 port group
 - 1) Brady Laser tab labels – 2.8" x 0.375" LAT-43-707
 - 2) Hubbell XPLPPA series
 - 3) Leviton
 - 4) Panduit.
 - 5) or equal.
 - b. 6 port group
 - 1) Brady Laser tab labels – 3.6" x 0.375", LAT-44-707
 - 2) Hubbell
 - 3) Leviton
 - 4) Panduit.
 - 5) or equal.
 - c. Individual port
 - 1) Brady
 - a) TLS2200 labels – 0.5" x 0.375" white, PTL-44-422
 - b) Laser tab labels – 0.5" x 0.375" white, LAT-45-707
 - c) TLS2200 labels – 0.5" x 0.375" clear, PTL-44-430
 - d) Laser tab labels – 0.5" x 0.375" clear, LAT-45-712
 - e) TLS2200 labels – 0.5" x 0.5" white, PTL-7-422

- f) Laser tab labels – 0.5" x 0.5" white, LAT-46-707
 - g) TLS2200 labels – 0.5" x 0.5" clear, PTL-7-430
 - h) Laser tab labels – 0.5" x 0.5" clear, LAT-46-712
 - 2) Hubbell
 - 3) Leviton
 - 4) Panduit.
 - 5) or equal
 - d. Patch Panel Name Label.
 - 1) Hubbell XOLPPID Series
 - 2) Brady
 - 3) Leviton
 - 4) Panduit
 - 5) or equal.
2. Non-keystone based fiber patch panels
- a. Hubbell XPLFOSEPAW
 - b. Brady
 - c. Leviton
 - d. Panduit
 - e. as provided with Patch Panel by the manufacturer
 - f. or equal.
3. 110 blocks
- a. Brady Laser tab labels – 7.9" x 0.475" (200.6mm x 12.07mm), LAT-177-124
 - b. Hubbell XPL110 series.
 - c. Leviton
 - d. Panduit.
 - e. or equal.

2.04 GROUNDING AND BONDING, PATHWAY, AND SPACE LABELS

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Manufacturers:
 - 1. Brady Corporation
 - a. TLS2200 labels
 - 1) PTL-20-422, Size 2.0" x 1.0"
 - 2) PTL-22-422, Size 3.0" x 1.0"
 - 3) PTL-37-422, Size 3.0" x 1.9"
 - 4) PTL-23-422, Size 4.0" x 1.0"
 - 5) PTL-38-422, Size 4.0" x 1.0"
 - b. Laser tab labels
 - 1) LAT-13-747, Size 1.875" x 0.833"
 - 2) LAT-24-747, Size 1.75" x 1.0"
 - 3) LAT-32-747, Size 3.0" x 0.9 "
 - 4) LAT-33-747, Size 2.0" x 1.437"
 - 5) LAT-34-747, Size 3.0" x 1.437"
 - c. Continuous tape for TLS2200
 - 1) PTL-8-422, Size 0.5" white polyester
 - 2) PTL-8-430, Size 0.5" clear polyester

- 3) PTL-8-439, Size 0.5" white vinyl
 - 4) PTL-42-439, Size 1.0" white vinyl
 - 5) PTL-43-439, Size 1.9" white vinyl
2. Panduit.
 3. or equal.

2.05 WORKSTATION LABELS

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Where insert type labels are used provide clear plastic cover over label.
- D. Manufacturers:

1. Brady Corporation
 - a. Desi-strip inserts
 - 1) TLS2200 labels –1.9"x0.375" white, PLT-40-412
 - 2) Laser tab labels –1.9"x0.375" white, LAT-176-124
 - b. Location ID
 - 1) TLS2200 labels - 1.0" x 0.375" white, PTL-16-422
 - 2) Laser tab labels –1.0" x 0.375" white, LAT-47-707
 - 3) TLS2200 labels- 1.0" x 0.375" clear, PTL-16-430
 - 4) Laser tab labels –1.0" x 0.375" clear, LAT-8-712
 - 5) TLS2200 labels- 1.0" x 0.5" white, PTL-17-422
 - 6) Laser tab labels –1.0" x 0.5" white, LAT-7-707
 - 7) TLS2200 labels- 1.0" x 0.5" clear, PTL-17-430
 - 8) Laser tab labels- 1.0" x 0.5" clear, LAT-7-712
 - 9) TLS2200 labels- 1.5" x 0.375" white, PTL-45-422
 - 10) Laser tab labels- 1.5' x 0.375" white, LAT-47-707
 - 11) TLS2200 labels- 1.5" x 0.375" clear, PTL-45-430
 - 12) Laser tab labels-1.5" x 0.375" clear, LAT-47-712
 - 13) TLS2200 labels- 1.5" x 0.5" white, PTL-29-422
 - 14) Laser tab labels- 1.5" x 0.5" white, LAT-47-707
 - 15) TLS2200 labels- 1.5" x 0.5" clear, PTL-29-430
 - 16) Laser tab labels-1.5" x 0.5" clear, LAT-47-712
 - c. Outlet/Jack ID
 - 1) TLS2200 labels -0.5" x 0.375" white, PTL-44-422
 - 2) Laser tab labels – 0.5" x 0.375" white, LAT-45-707
 - 3) TLS2200 labels - 0.5" x 0.375" clear, PTL-44-430
 - 4) Laser tab labels –0.5" x 0.375" clear, LAT-45-712
 - 5) TLS2200 labels - 0.5" x 0.5" white, PTL-7-422
 - 6) Laser tab labels- 0.5" x 0.5" white, LAT-46-707
 - 7) TLS2200 labels - 0.5" x 0.5" clear, PTL-7-430
 - 8) Laser tab labels - 0.5" x 0.5" clear, LAT-46-712
 - d. General Use Labels
 - 1) TLS2200 labels - 0.375" cont. white, PTL-46-422
 - 2) TLS2200 labels - 0.375" cont. clear, PTL-46-430
2. Hubbell

- a. Location ID
 - 1) Desi-Strip Style
 - a) XPLFP10W
 - 2) Adhesive
 - a) XPLFPA10W, XPLFPA10W,
- b. Outlet/Jack ID
 - 1) XPLIPA10W, XPLIPA10C
 - 2)
- 3. Leviton
- 4. Panduit.
- 5. or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Apply labeling to clean surfaces free of oil, dust, solvents or loose material.
- B. Apply after Project painting in area of application is complete.
- C. Apply to locations where labeling will not be damaged, covered over or in the way of the ordinary maintenance and operation of the installed communications infrastructure or system.
- D. Apply labeling right side up, parallel to major edges of surfaces to which it is applied. When no line is evident, apply parallel to floor line. Correct conditions of labeling applied out of true.
- E. Protect installed labeling from damage.
- F. Replace labeling that is defaced, illegible or peeling off of the surface to which it is applied.

3.02 WORKSTATION JACK, CABLE AND PATCH PANEL ASSIGNED CIRCUIT NUMBERS

- A. The Owner will provide the Contractor copies of the Contract Drawings showing station outlets with Owner assigned data & voice jack ID numbers. Label all installed work according to this master set.
- B. The cover plate area directly above and beneath the jacks are the labeling areas. In the top area, using the specified means, label the faceplate number assigned on the contract documents.
- C. For above-ceiling outlets, in addition to the outlet labeling, the contractor shall provide an outlet label on the nearest T-bar suspension beam.

3.03 IDENTIFICATION & LABELING

- A. Pathways

1. Pathways shall be marked at each endpoint and at all intermediate pull or junction boxes. In the case of partitioned pathways (i.e. innerduct) each partition shall have a unique identifier.
 2. Label pathways using the appropriate abbreviation and a number.
 3. Use adhesive type labels.
- B. Labels shall be affixed at the entry to all telecommunications rooms and spaces (Includes entrance facilities, communication equipment rooms, communication equipment spaces and work areas)
1. Use adhesive type labels for all communications space labeling,
 2. Affix labels to entrance doors – coordinate location with Owner's Representative.
- C. Cables
1. Horizontal and Indoor Backbone Cables shall be marked within 12" of each endpoint or to innerduct in which the cable is installed.
 2. Except where installed in innerduct or conduit, all backbone fiber optic cable shall have affixed to the outer jacket, labels of a bright color that contain at least the legend "FIBER OPTIC CABLE." These labels must be affixed at separations no greater than 10 ft.
 3. Within every manhole/vault/pullbox and within 4 ft of the entrance into a building every backbone cable's assigned identifier shall be affixed to either the cable's outer jacket or to innerduct in which the cable is installed.
 4. Any cable installed in conduit shall be labeled at all intermediate pull or junction boxes.
 5. Label cables using the appropriate circuit ID.
 6. Use adhesive type labels for all communications cable labels.
 7. Affix labels to cables – marking cable is not permitted.
 8. Where cable is fully encased in innerduct label the outside of the innerduct with the cable label and, where the contents are fiber optic cabling, the "FIBER OPTIC CABLE" label.
 9. Labels for backbone cables shall be:
 - a. WHITE for voice copper feeder
 - b. YELLOW for data fiber feeder
 - c. RED for FA fiber feeder
 - d. BLUE for AV fiber feeder
- D. Patch Panels
1. Fiber patch panels shall be marked using adhesive labels indicating the range of circuits installed to it. All fiber optic cable patch panels shall be labeled with both the

pair count of every fiber pair, the cable's assigned identifier, and where shown on the plans, the patch panel's assigned identifier.

2. If not shown on the Contract Documents, Owner's Representative will provide specific circuit ID information.
3. Category rated patch panels shall be labeled with an identifier, individual ports shall be labeled to indicate circuit and identification of station plate in which the circuit terminates.

E. 110 blocks

1. Each cable termination position on 110 blocks shall be labeled with number designators.
 - a. All backbone copper cable termination blocks shall be labeled with both the pair count of every 5th pair and the cable's assigned identifier.
2. Where insert type labels are used install clear plastic cover over reprinted or Laser printed type label.

F. Workstations

1. All faceplate labels shall indicate the faceplate number and the circuit ID for each cable that it houses
2. For faceplates where insert type labels are used install clear plastic cover over preprinted or Laser printed type label.
3. For faceplates without insert type labels use adhesive type labels affix labels to faceplate – marking faceplates is not permitted.
4. Patch cords installed under the work of this Project shall be labeled at each endpoint using the appropriate circuit ID.
5. Use adhesive type labels for all communications cable labels.
6. Affix labels to cables – marking cable is not permitted.

G. Grounding and Bonding

1. The TMGB(s) (telecommunications main ground bar) shall be labeled as such with an adhesive type label(s) affix label(s) to TMGB.
2. The conductor connecting the TMGB (telecommunications main ground bar) to the building ground shall be labeled at each end with an affixed label in a visible location as close as practicable to the bonding point at each end of the conductor.

H. Firestopping

1. Each firestopping location shall be labeled at each location where firestopping is installed, on each side of the penetrated fire barrier, within 12 in. of the firestopping material.

PSB – Detention Area Automation Upgrades	City of Berkeley

END OF SECTION

SECTION 27 10 00

STRUCTURED CABLING, BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This Section defines common means and methods for the work of the following Sections:
 - 1. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
 - 2. Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - 3. Section 27 11 23 – Communications Cable Management
 - 4. Section 27 15 00 – Communications Horizontal Cabling

1.02 RELATED DOCUMENTS

- A. Section 27 05 00 – Common Work Results for Communications applies to the work of this Section.

1.03 REFERENCES

- A. In Addition to the requirements of Section 27 05 00 – Common Work Results for Communications, conform to the applicable portions of the following standards agencies:
 - 1. Telecommunications Industry Association/Electronic Industries Association (TIA/EIA) Telecommunications Industry Association/Electronic Industries Association (TIA/EIA)
 - a. ANSI/TIA/EIA-568-C.1-2009 Commercial Building Telecommunications Cabling Standard
 - b. ANSI/TIA-569-C-2012 Telecommunications Pathways and Spaces
 - c. ANSI/TIA/EIA-606-B-2016 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - 2. National Fire Protection Association (Nfpa)
 - a. NFPA 70 National Electrical Code

1.04 DEFINITIONS

- A. Unless otherwise specified or indicated, electrical and electronics terms used in this specification shall be as defined in
 - 1. ANSI/TIA/EIA-568-C.1
 - 2. ANSI/TIA/EIA-606-B
 - 3. IEEE Std 100

- B. Campus Distributor (CD) - A distributor from which the campus backbone cabling emanates. (International expression for main cross-connect (MC).)
- C. Building Distributor (BDF) - A distributor in which the building backbone cables terminate and at which connections to the campus backbone cables may be made. (International expression for intermediate cross-connect (IC).)
- D. Floor Distributor (FD) - A distributor used to connect horizontal cable and cabling subsystems or equipment. (International expression for horizontal cross-connect (HC).)
- E. Telecommunications Room (TR) - An enclosed space for housing telecommunications equipment, cable, terminations, and cross-connects. The room is the recognized cross-connect between the backbone cable and the horizontal cabling.
- F. Entrance Facility (EF) (Telecommunications) An entrance to the building for both private and public network service cables (including antennae) including the entrance point at the building wall and continuing to the entrance room or space.
- G. Entrance Room (ER) (Telecommunications) - A centralized space for telecommunications equipment that serves the occupants of a building. Equipment housed therein is considered distinct from a telecommunications room because of the nature of its complexity.
- H. Open Cable - Cabling that is not run in a raceway as defined by NFPA 70. This refers to cabling that is "open" to the space in which the cable has been installed and is therefore exposed to the environmental conditions associated with that space.
- I. Open Office - A floor space division provided by furniture, movable partitions, or other means instead of by building walls.
- J. Pathway - A physical infrastructure utilized for the placement and routing of telecommunications cable.

1.05 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 27 05 00 – Common Work Results for Communications Systems and the following:
- B. Shipping Conditions:
 - 1. All cable shall be shipped on reels or manufacturer supplied "handy boxes".
 - 2. The diameter of the drum shall be at least 13 times the diameter of the cable.
 - 3. The reels shall be substantial and so constructed as to prevent damage during shipment and handling.

4. Secure the outer end of the cable to the reel head so as to prevent the cable from becoming loose in transit.
5. Project the inner end of the cable into a slot in the side of the reel, or into a housing on the inner slot of the drum, in such a manner and with sufficient length to make it available for testing.
6. The inner end shall be fastened so as to prevent the cable from becoming loose during installation. End seals shall be applied to each of the cables to prevent moisture from entering the cable.

C. Storage:

1. Retain factory cable protection until installation. Supplement with heavy gauge plastic sheeting if factory protective membrane is pierced prior to installation. Tape ends and seams water and dust tight.
2. The reels with cable shall be suitable for outside storage conditions when the temperature ranges from minus 40 degrees C to plus 65 degrees C, with relative humidity from 0 to 100 percent.
3. Protect cable reels from physical damage from site construction vehicles or from settling into the soil.
4. Equipment, other than cable, to be delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variation, dirt and dust, or other contaminants.

1.07 PERFORMANCE STANDARDS

A. Category 6A Copper Data Service Cabling Plant:

1. To EIA/TIA standards referenced herein for Category 6A. Performance requirement is for circuit end-to-end.

1.08 TESTING

A. General

1. Test and report on each intermediate cabling segment separately, including station cabling, horizontal distribution (each segment, if multiple) and telecommunications room wiring.
2. Test each end to end cable link.
3. Submit machine-generated documentation and raw data of all test results on Contractor-provided, and City's Representative approved, forms; and in electronic format approved by the City's Representative.

B. Test Equipment:

1. Provide in conformance with the applicable requirements of 27 05 00 - Common Work Results for Communications .

2. Test systems using at least one (1) each of the following test measurement devices or their functional equivalents:
 - a. Category 6A Cable Pair Tester – Fluke/Microtest , Agilent or equal.
 - b. Tone Test Sets.
 - c. Site portable communications systems (walkie-talkie, cell phone or similar).
 - d. Any other items of equipment or materials required to demonstrate conformance with the Contract Documents.

C. Station Wiring, General

1. Test station wire only after all pairs of station wire in an work area have been terminated at both ends, and no work of this Section or other Sections may cause physical disturbance to the wiring.
2. Correct any and all transpositions found. Retest.
3. If any conductor in a station wire tests either open or short, then the entire station wire is to be removed, replaced, and re-tested.

D. Inside Category 6A Cabling.

1. Using the listed Category 6A cable test set, test and submit report on the parameters specified for Category 6A cabling in this Section. Report whether tested link passes or fails the Category 6A standards in Part 2 of this Section.
2. As a minimum, all cables shall be tested with a Level III test set for Category 6A compliance with the following tests: wire map, length, insertions loss, NEXT loss, PSNEXT loss, ELFEXT, PSELFEXT, return loss, propagation delay and delay skew.
3. Note exceptions to required Category standards. Remedy and retest.

PART 2 PRODUCTS

2.01 COMMUNICATIONS CABLES AND RELATED

A. GENERAL:

1. Cabling shall be UL listed for the application and shall comply with EIA TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3 and NFPA 70.
2. Ship cable on reels and/or in boxes bearing manufacture date for UTP in accordance with ICEA S-90-661 for all cable used on this project. Cabling manufactured more than 12 months prior to date of installation shall not be used.
3. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
 - a. At risers and plenums, provide type CMP cabling.

PART 3 EXECUTION

3.01 GENERAL

- A. All system cabling and terminations be installed in accordance with the manufacturer's instructions and as shown.
- B. All necessary interconnections, services, and adjustments required for a complete and operable system shall be provided. All installation work must be done in accordance with the safety requirements set forth in the general requirements of ANSI C2 and NFPA 70.
- C. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- D. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
- E. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire or cable shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
- F. Correct unacceptable wiring conditions including but not limited to:
 - 1. Deformed, brittle or cracked insulation.
 - 2. Torn or worn cable jacket.
 - 3. Excessively scored cable jackets.
 - 4. Insulation shrunken or stripped further than 1/8" away from the actual point of connection within a connector, or on a punch block.
 - 5. Ungrommited, unbushed, or uninsulated wire or cable entries.
 - 6. Deformation or improper radius of wire or cable.

3.02 SPLICING

- A. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
 - 1. At designated splices, maintain conductor color code across all splices.
 - a. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures.
 - b. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards.

3.03 PULLING IN

- A. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.

- B. Inspect all conduit bends to verify proper radius. Comply with Code for minimum permissible radius and maximum permissible deformation.
- C. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Use multi-spool rollers where cable is pulled in place around bends. Do not pull reverse bends.
- D. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.

3.04 SUPPORT

- A. Separation. Conform to the following table with respect to separation from power and radio frequency (RF) sources. Provide at least twice the listed separation at fluorescent light fixtures, ballasts and similar high intensity Electromagnetic Field sources, including but not limited to motors, transformers and copiers.

Separation of Telecommunications Cabling and Pathways from 480 V or Lower Power Lines
Condition Minimum Separation Distance

	< 2kVA	2-5 kVA	> 5kVA
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways.	5 in.	12 in.	24 in.
Unshielded power lines in proximity to a grounded metal conduit pathway.	2.5 in.	6 in.	12 in.
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway.	N/A	3 in.	6 in.

- B. Support: Provide support for all cabling. Conform to the restrictions of the National Electric Code and Section 27 05 29.

END OF SECTION

SECTION 27 11 16

COMMUNICATIONS CABINETS, RACKS, FRAMES AND ENCLOSURES

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Communications racks and cabinets.

1.2 RELATED WORK IN OTHER SECTIONS

- A. Division 26
- B. Section 27 05 26 – Grounding and Bonding for Communications Systems
- C. Section 27 05 33 – Conduits and Backboxes for Communications Systems
- D. Section 27 05 36 – Cable Trays for Communications Systems
- E. Section 27 15 00 Communications Horizontal Cabling

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. EIA-310-D (1992) Cabinets, Racks, Panels, and Associated Equipment (ANSI/EIA/310-D)
 - 2. ANSI-J-STD-607-B (2011) Generic Telecommunications Bonding and Ground (Earthing) for Customer Premises

1.4 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

PART 2 - PRODUCTS

2.1 GENERAL

- A. KEYS
 - 1. Key all boxes, cabinets, enclosures, panels, controls, doors and related provided for similar usage within a system identically.

2.2 EQUIPMENT ENCLOSURE SYSTEMS

- A. General:
 - 1. Provide enclosure systems including, but not limited to enclosures, cabinets, cases and related panels and accessories as specified herein. Provide size and quantity as shown on drawings or scheduled.
 - 2. Provide color as shown on drawings. If no color is shown on drawings, submit manufacturer's standard color chips for selection.
 - 3. Provide enclosure systems conforming to the IBC, latest edition, for bracing design.

4. Equipment Enclosures: Each rack provided with frame angles tapped 10-32, ANSI/EIA 310-D Universal Spaced.
- B. Wall Mount Swing-Out Relay Rack.
1. Drawing Reference: R2.
 2. Construction:
 - a. Support Frame: Wall (backboard) mounted.
 - b. Open frame - C shaped or 3 sided box construction
 - c. Swing-out EIA equipment Frame: Rack mounting; 19 inch EIA
 - d. Clear depth (equipment depth) behind rack rail face: 24 inches.
 - e. Swings open 90 degrees.
 - f. Lateral hinged latches constrain cabling at 12" o.c. spacing min.
 - g. Latch in open and closed partitions.
 - h. Load capacity; 150 pounds.
 - i. UL listed.
 3. Manufacturer:
 - a. CPI Standard Swing Gate Wall Rack 11790-725
 - b. Or equal
- C. Equipment Rack, Zone 4, Front, Rear and Side Access, with Vertical Wire Management.
1. Drawing References: R28
 2. Minimum Features, Function & Construction:
 - a. Manufacturer tested Zone 4 assembly, rated for at least 900 pounds of uniformly distributed load, upper floor load, of essential equipment per California Building Code/Uniform Building Code.
 - b. Fully welded construction provides:
 - 1) Static load capacity: 10,000 lbs.
 - 2) UL Listed load capacity: 2,500lbs.
 - 3) Seismic Certified load capacity: 755 lbs.
 - c. Seismic certified to the following codes and standards: 2007 & 2010 CBC; 2006, 2009 & 2012 IBC; ASCE 7-05 (2005 Edition) & ASCE 7-10 (2010 Edition) and the 2006 & 2009 editions of NFPA 5000 for use in areas of high seismicity – Zone 4 or Seismic Design Category (SDC) "D". Intended for use in Mission Critical and/or High-Importance Installations in locations with the highest level of seismicity and top floor or rooftop installations including those within UBC and CBC Essential facilities or IBC, ASCE 7, and NFPA 5000 Seismic Use Group III facilities. For all codes, the Importance factor (Ip) is 1.5.
 - d. Vertical Height (Min): 44 RU
 - e. Outside depth: 40" minimum - 42 inches maximum.
 - f. Width: Not to exceed 30 inches
 - g. Lockable, 70% open area perforated mesh full height front and rear doors:
 - 1) Front door with wire mesh insert covers rack contents - swing shall be field adjustable to swing from either right or left.
 - 2) Rear doors to be a pair of half width doors, each with a wire mesh to cover rack contents.
 - 3) Wire mesh, vertical center split rear door pair.
 - h. Front and rear 19" mounting rail pairs DIN square holes on EIA spacing standard are fully adjustable in depth of setback from front to rear.
 - i. Vertical cable management rings, continuous, full height cable management system shall be installed:
 - 1) fully inside of the rack enclosure, with 2" minimum clearance behind front and rear rack frame.
 - 2) fully outside (to left of left rail and to right of right rail, and out of conflict with EIA Rails. Cable management system mounting shall not occupy rail screw openings.

- 3) Front managers shall be accessible from front in fully loaded equipment rack.
- 4) Rear managers shall be accessible from rear in fully loaded equipment rack
- j. 60% or greater perforated top panel occupying at least 50% of the stop surface of the cabinet allows passive heat radiation from rack interior to the exterior.
- k. Cutouts and removable covers in cabinet top accommodates vertical transition of cabling from tray above into rack interior.
- l. Gangable. Racks have been designed such that they are suitable for installation either as a single, standalone unit, or in a row of identical racks (gangable).
 - 1) Single rack installation. Provide side panels at both sides.
 - 2) Multirack installation in a row. Bolt racks together using means provided by manufacturer. Omit side panels except at ends of row of racks – provide at ends of rows of racks.
- 3. Manufacturers. Provide manufacturer's accessories or 3rd party accessories as specified elsewhere in this Section for other specified elements. Coordinate selected shelves, fans and similar with rack submitted for finish and mounting means.:
 - a. Middle Atlantic DRK19-44-42PRO with DLVFD-44 front door, DCLVRD-44 rear doors, MRK-Z4 Base angles, 2 pair DRK-44DUCT (front and rear, 4 total vertical ducts),MW-LVT 64% open area top insert. Keylocked side panels SPN-44-36 at ends of rows.
 - b. CPI Z4-Series Seismic Frame Cabinet
 - c. or equal.

2.3 RACK PANELS AND ACCESSORIES

A. Rack Mounting Screws:

- 1. Screws 10-32; length as required for at least 1/4" excess when fully seated; oval head with black plastic non marring cup washer or equivalent ornamental head; nickel, cadmium or black plated; Phillips, Allen Hex, Square-Tip or Torx drive. Slotted screws are not acceptable.

B. Blank Panels:

- 1. Construction
 - a. 16 gauge minimum cold rolled steel
 - b. Powder coat finish to match rack color, unless otherwise noted
- 2. Manufacturers
 - a. Middle Atlantic Products EB or FEB Series.
 - b. Ortronics Filler Panels.
 - c. CPI Snap-In Filler Panel
 - d. Atlas Sound S19 Series.
 - e. BGW Systems Inc. Flanged Steel Blank Panels
 - f. Dukane
 - g. Elkay
 - h. Lowell Series L3
 - i. Zero ZP112000 Series.
 - j. Hubbell
 - k. or equal.

C. Vent Panels:

- 1. Construction
 - a. 20 gauge minimum cold rolled steel
 - b. 1/8" minimum holes, at least 70% open total panel cross-section.
 - c. Powder coat finish to match rack color, unless otherwise noted
- 2. Manufacturers
 - a. Atlas Sound SVP Series.
 - b. BGW Systems Inc. Perforated Vent Panels

- c. House of Metal Enclosures (HOME) Series PRP.
 - d. Lowell Series L5
 - e. Middle Atlantic Products VT Series.
 - f. Zero.
 - g. or equal.
- D. Vertical Lacer Strips
 - 1. 44RU high vertical steel strips with points for attachment of velco cable ties at at least 6" o.c.
 - 2. Manufacturer:
 - a. Middle Atlantic LACE-44LP
 - b. APW
 - c. or equal.
- E. Horizontal Lacer Bars
 - 1. EIA 19" Width steel strips or bars suitable to provide support to large cable dressed horizontally through racks
 - 2. Size to suit load and mounting width.
 - 3. Manufacturer:
 - a. Middle Atlantic LBP-1R4, LBP-1.5 and LBP-1S.
 - b. APW
 - c. or equal.
- F. Seismic Hold-down Equipment Straps
 - 1. Drawing Reference: None - Provide as required to secure equipment that can not be screw fastened to mounting shelves.
 - 2. Manufacturers:
 - a. BGW Systems
 - b. Everest Electronic Equipment Lock Down Kit
 - c. Ergotron
 - d. Chatsworth Products
 - e. Middle Atlantic Products
 - f. Q-Safety, Inc.
 - g. or equal.

PART 3 - EXECUTION

3.1 MOUNTING

- A. Unless otherwise noted, all floor supported equipment racks shall be bolted to the structure in accordance with the requirements of the CBC and the contractor's approved structural engineering submittal demonstrating the method to be used to conform to these requirements.
- B. Rows of identical racks shall be bolted together, in addition to being bolted to the floor, and bonded to form a single electrical ground plane.
- C. Wall mounted equipment racks and cabinets shall similarly be bolted to structural members in accordance with the requirements of the CBC and the contractor's approved structural engineering submittal demonstrating the method to be used to conform to these requirements.

3.2 EQUIPMENT ENCLOSURE (RACK) AND EQUIPMENT BACKBOARD FABRICATION

- A. Combustible material, other than incidental trim of indicated equipment, is prohibited within equipment racks.

- B. Provide permanent labels for all equipment and devices.
- C. Floor racks to be bolted floor unless otherwise indicated.
- D. Access shall not require demounting or de-energizing of equipment. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- E. Provide a permanent label on the front of each equipment rack including the rack designation, and the circuit breaker number and associated electrical distribution panel designation servicing same.
- F. Where wiring of mixed types are called for on the plans, maintain separation of wiring classifications as specified in the individual sections of Division 27.
- G. Provide vertical wire management of cabling within the rack independent of the adjustable EIA mounting rails. Vertical wiring management provided by the contractor within the rack shall not prevent such rails from being moved as required by the Owner.
- H. Dress and support cabling at a minimum of 24 inch on center.
- I. Access shall not require demounting or de-energizing of equipment or cabling. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- J. Fasten removable covers containing any wired component with a continuous hinge along one side, with associated wiring secured and dressed to provide an adequate service loop. Provide an appropriate stop locks to hold all hinged panels and drawers in a serviceable position.
- K. Provide permanent labels for all equipment and devices. Where possible, fasten such labels to the rack frame or to blank or vent panels which will remain in place when active equipment is removed for possible service.
- L. Coordinate the design and execution of wire harnessing of multi-bay audio and video rack ensembles with conditions of delivery to installation locations at Project Site, and with the requirement herein for test of the completely wired system in the shop prior to delivery to the Project Site. Organize the wiring harnesses such that they will fold within one shippable unit without risk of damage, or provide polarized multipin connectors and related interconnect systems as specified elsewhere herein.

3.3 SIGNAL GROUNDING & BONDING PROCEDURES

- A. Comply with National Electrical Code. Bond equipment racks to ground in accordance with the California Electric Code, ANSI/ TIA 607B-2011 and Section 27 05 26
- B. Unless otherwise noted maintain a unipoint ground scheme.
- C. Equipment enclosures shall not be permitted to touch each other unless bolted together and electrically bonded.

END OF SECTION

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SECTION 27 11 19

COMMUNICATIONS TERMINATION BLOCKS AND PATCH PANELS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This Section defines material standards for:
 - 1. Copper Termination Assemblies, including
 - a. Rack and cabinet mounted copper patch panels
 - b. Backboard, rack and cabinet mounted terminal blocks

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Section 27 05 00 – Common Work Results for Communications
- B. Section 27 05 26 – Grounding and Bonding for Communications Systems
- C. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- D. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
- E. Section 27 11 23 – Communications Cable Management
- F. Section 27 15 00 – Communications Horizontal Cabling

1.03 REFERENCES:

- A. ELECTRONIC INDUSTRIES ALLIANCE (EIA)
 - 1. EIA/ECA-310-E (2005) Cabinets, Racks, Panels, and Associated Equipment

1.04 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

PART 2 PRODUCTS

2.01 COPPER CABLE TERMINATION DEVICES AND RELATED

- A. Data Patch Panels, Category 6A Rated, Rack Mounted
 - 1. Drawing References:
 - a. ***C6APP (Flat), where *** refers to port count.

2. Functions/Features:
 - a. 19" EIA rack mountable.
 - b. Bent in center, with jacks arranged on angled planes to each side of bend to force patch cables to dress toward racks edges.
 - c. 48 ports per EIA rack unit (3.50").
 - d. Industry standard RJ-45 jacks inserted in openings in steel plate
 - 1) Arranged in rows on steel panel,
 - 2) Jacks on front,
 - 3) Terminations on rear.
 - 4) Patch panel and Port identifier label space on front – label per Section 27 05 53 - Identification for Communications Systems.
 - e. Each opening to be filled with jacks as specified in Section 27 15 00 - Communications Horizontal Cabling. Match the color coding specified.
3. Manufacturer
 - a. Commscope
 - b. Or equal

2.02 CABLE TERMINATION DEVICES AND RELATED, NON-CATEGORY RATED

A. Cable Termination Devices and Related:

1. Screw type or Tubular Clamp Barrier Blocks:
 - a. Manufacturers:
 - 1) Buchanan 125, 0625 Series.
 - 2) Electrovert.
 - 3) TRW Cinch 140, 141, 142 Series.
 - 4) Weidmuller.
 - 5) Pass & Seymour/Legrand.
 - 6) Phoenix.
 - 7) or equal.
2. Tubular Clamp Barrier Blocks, High Density, Switch Block Section
 - 1) Paired screw terminals on opposite sides of insulating base.
 - 2) Base mounts to DIN rail, providing space beneath to dress field and source cabling.
 - 3) Terminates range of wire gages used by project – at least 30 gage to 10 gage.
 - 4) High density:
 - a) At least 33 pairs of connections per foot for 12 and smaller gage terminations,
 - b) At least 16 pairs of connections per foot for 10 gage terminations.
 - 5) Switch Block Section permits load, such as field devices, to be separated from monitoring panel for testing independent of source then restored without disturbing field wiring terminations.
 - 6) Rated at least fifteen (15) amperes at 300V AC/DC
- b. Approvals
 - 1) UL
- c. Manufacturers:
 - 1) Allen Bradley Isolation Switch Blocks,
 - a) 1492-H7 for 30 to 12 gage
 - b) 1492-CE9 for 10 gage.
 - 2) Tyco Buchanan 0135 Series.
 - 3) WECO Electrical Connectors
 - 4) Altech
 - 5) Curtis Industries

- 6) Electrovert
 - 7) Weidmuller
 - 8) Pass & Seymour/Legrand
 - 9) Phoenix
 - 10) or equal.
3. Low Level Audio Cable Termination, Insulation Displacement Products. Coordinate with wire size, type and insulation
- a. Manufacturers:
 - 1) ADC "Dense Patch".
 - 2) ADC UP3, UP3 N.
 - 3) ADC I.C.O.N. Series.
 - 4) AMP "AMP BARREL".
 - 5) Gentner Electronics Flexiblock Series.
 - 6) Gentner Electronics EasyTerm Series.
 - 7) Siemon Model S66M450 with D10 Designation Strip.
 - 8) Leviton
 - 9) Any meeting 100TB requirements of Section 16765.
 - 10) Or equal.
4. Low Level Audio Cable Termination, "Christmas Tree" or "Vee" Blocks
- a. Manufacturers:
 - 1) ADC Model PJ 660 6.
 - 2) Or equal by Thomas and Betts
 - 3) or equal.

PART 3 EXECUTION

- A. Refer to Section 27 10 00 – Structured Cabling, Basic Materials and Methods and Section 27 15 00 – Communications Horizontal Cabling.

END OF SECTION

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SECTION 27 11 23

COMMUNICATIONS CABLE MANAGEMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Section includes provision of cable management for cabling installed under the work of this Project as well as patch cords at equipment racks
- B. Scope includes:
 - 1. Innerduct
 - a. Interior
 - b. Outside Plant
 - 2. Cable End Spillway
 - 3. Backboard Cable Management
 - 4. Patch Panel Cable Management at racks and cabinets

1.02 RELATED WORK IN OTHER SECTIONS

- A. Section 27 05 33 – Conduits and Backboxes for Communications Systems
- B. Section 27 05 36 – Cable Trays for Communications Systems
- C. Section 27 05 53 – Identification for Communications Systems
- D. Section 27 10 00 – Structured Cabling, Basic Materials and Methods
- E. Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures
- F. Section 27 11 19 – Communications Termination Blocks and Patch Panels
- G. Section 27 15 00 – Communications Horizontal Cabling

1.03 SUBMITTALS

- A. Conform with the requirements Section 27 05 00 - Common Work Results for Communications.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

PART 2 PRODUCTS

2.01 PATCH PANEL CABLE MANAGEMENT

A. Patch Panel Wire Management, Rack Mounted, Snap Cover.

1. Drawing References:
 - 1) 1 and 2 RU Version: WIRE MANAGER
2. Construction
 - a. EIA 19 " Rack Mount, as required
 - b. Continuous flexible system of T shaped fingers and slots along top and panel, deburred to avoid snagging patch cord jacket.
 - c. Contoured front door with snap-hinges swings up or down and stays in the open position while cabling.
 - d. Three edge-protected, oval-shaped pass-through ports allow patch cords to pass front-to-rear.
 - e. Select depth to match installed depth of vertical wire managers
3. Capacity
 - a. 1 RU - accommodates at least 35 patch cords.
 - b. 2 RU - accommodates at least 70 patch cords.
4. Manufacturers:
 - 1) Commscope
 - 2) or equal.

2.02 CONDUIT CABLE MANAGEMENT

A. Conduit End Waterfall Spillway

1. Drawing Reference: CEW
2. Features/Functions
 - a. Spillway fastens to end of EMT conduit, provides radius sweep, open on top, solid from below
 - b. Maintains proper bend radii for fiber/cable
 - c. Provides tie points for fire pillow retention
 - d. Supports up to 100 lbs. of hanging fiber/cable
 - e. Clamp for securing to EMT
 - f. Self-fastening tie down system for supporting cabling
3. Construction:
 - a. Fire Retardant ABS
4. Manufacturers:
 - a. Bejed BJ-2049 Spillway.

2.03 BACKBOARD CABLE MANAGEMENT

A. Wire Management Rings, Wall/Ceiling Mounted:

1. Drawing References/Functions Features:
 - a. WMRB - Bridle Ring Type, Threaded Lag Screw

- b. WMRC - Closed Ring, U shaped assembly with two screw holes at ends,
 - c. WMRO - Open, Re-enterable Split Ring permitting cables to be inserted midspan, two screw holes at ends
 - d. WMP** - Steel back board with 4 inch deep min, 8 inch wide vertical wire management rings, front enterable. Provide trough at bottom of each column of WMP.
 - e. WMP**T - Narrow, steel back board with 4 inch deep min, 3 inch wide vertical wire management rings, front enterable.
2. Provide as required to support indicated cable bundle and location.
3. Provide type WMRB at wood frame construction for cable hung from underside of ceiling, unless otherwise noted.
4. Manufacturers:
- a. WMRB:
 - 1) B-Line Fasteners, BR Series
 - 2) Senior Industries
 - 3) T&B
 - 4) or equal.
 - b. WMRC
 - 1) Chatworth Products Wall Mount Closed D Ring.
 - 2) Senior Industries
 - 3) or equal.
 - c. WMRO
 - 1) Chatworth Products Wall Mount Open Ring.
 - 2) AllenTel
 - 3) Systimax, Inc.
 - 4) Siemon
 - 5) or equal.
 - d. WMP
 - 1) Siemon S188-*** to match adjacent terminal blocks with S188-WD
 - 2) Ortronics OR-806003194 or OR-806003196 to match terminal blocks.
 - 3) By any manufacturer listed for 110TB under Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - 4) or equal.
 - e. WMP**T
 - f. Siemon S110M-WM-*** to match adjacent terminal blocks
 - g. By any manufacturer of listed for 110TB under Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - h. or equal.

PART 3 EXECUTION

3.01 CONDUIT END WATERFALL

- A. Fasten securely to conduit end wherever cabling will exit conduit 18" or more above the cable tray to prevent damage due to cabling due to weight of cable bearing on a conduit end.
- B. Secure cabling with integral cable restraint system.

END OF SECTION

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SECTION 27 15 00

COMMUNICATIONS HORIZONTAL CABLING

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes, but is not necessarily limited to provision of:
 - 1. Horizontal Station Cabling
 - a. Horizontal copper station cabling, meeting EIA/TIA Category 6A standards, homerun from receptacles to indicated IDF. Terminated on rack mounted patch panels, as indicated.
 - 2. For all cabling:
 - a. Terminate on patch panels as specified in Section 27 11 19 – Communications Termination Blocks and Patch Panels.
 - b. Test cabling to demonstrate performance to specified standards or better using test equipment and methods as specified in Section 27 10 00 - Structured Cabling – Basic Materials & Methods.
 - c. Label cables, jacks, plates and patch panels as specified in Section 27 05 53 – Identification for Communications Systems.
 - d. Document on Record Documents as described in Section 27 05 00 – Common Work Results for Communications.
- B. Related Documents:
 - 1. Specification Section 27 05 00 – Common Work Results for Communications applies to this Section.
- C. Related Work in Other Sections:
 - 1. Section 27 05 29 – Hangers and Supports for Communications Systems
 - a. J-hooks and hangers for the work of this Section
 - 2. Section 27 05 33 – Conduits and Backboxes for Communications Systems
 - a. Empty raceway for the work of this Section.
 - 3. Section 27 05 36 – Cable Trays for Communications Systems
 - a. Empty tray for the work of this Section.
 - 4. Section 27 05 53 – Identification for Communications Systems
 - a. Labeling systems and execution for the work of this Section.
 - 5. Section 27 11 19 – Communications Termination Blocks and Patch Panels
 - a. Specification for patch panels and blocks used by work of this Section
 - 6. Section 27 11 23 – Communications Cable Management
 - a. Specification for innerduct, backboard and patch cord management used by the work of this Section.

1.02 REFERENCES

- A. As listed in Section 27 10 00 – Structured Cabling – Basic Materials & Methods.

1.03 SUBMITTALS

- A. Conform with the requirements of Section 27 05 00 - Common Work Results for Communications.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with Section 27 10 00 – Structured Cabling, Basic Materials and Methods.

PART 2 PRODUCTS

2.01 COPPER CABLING, CATEGORY RATED DATA/VOICE:

- A. High Speed, Category 6A Cabling, Plenum Rated
1. Drawing Reference: ** UTP6A-4P, where ** denotes cable count
 2. Construction Materials
 - a. Conductor Material Bare copper
 - b. Insulation Material Polyolefin
 - c. Jacket Material Low Smoke PVC
 - d. Separator Material FEP
 - e. Separator 2 Material FEP
 - f. Diameter Over Jacket 0.265 in
 - g. Jacket Thickness 0.016 in
 3. Electrical Specifications
 - a. ANSI/TIA Category 6A
 - b. dc Resistance Unbalance, maximum 4 %
 - c. dc Resistance, maximum 8.00 ohms/100 m
 - d. Mutual Capacitance 6.0 nF/100 m @ 1 kHz
 - e. Nominal Velocity of Propagation (NVP) 70 %
 - f. Operating Frequency, maximum 500 MHz
 - g. Operating Voltage, maximum 80 V
 - h. Transmission Standards ANSI/TIA-568-C.2 ISO/IEC 11801 Class EA
 - i. Dielectric Strength, minimum 1500 Vac, 2500 Vdc
 4. Environmental Specifications
 - a. Environmental Space Plenum
 - b. Flame Test Method CMP
 - c. Installation Temperature 0 °C to +60 °C (+32 °F to +140 °F)
 - d. Operating Temperature -20 °C to +75 °C (-4 °F to +167 °F)
 - e. Cable Type U/UTP (unshielded)
 - f. Pairs, quantity 4
 - g. Jacket Color: Blue
 - h. Conductor Gauge, singles 23 AWG
 - i. Conductor Type, singles Solid

- j. Conductors, quantity 8
 - k. Separator Type Isolator
 - l. Packaging Type Reel
 - m. Pulling Tension, maximum 11 kg | 25 lb
5. Agency Classification
- a. RoHS 2002/95/EC Compliant
 - b. ISO 9001:2008 Designed, manufactured and/or distributed under this quality management system
6. Manufacturer:
- a. Commscope
 - b. Or equal.

2.02 DATA & VOICE STATION JACKS & RECEPTACLES

A. Category 6A Data Jacks Performance Requirements, General

1. Dimensions:
 - a. Depth 1.20 in
 - b. Height 0.80 in
 - c. Width 0.80 in
 - d. Electrical Specifications
 - e. ANSI/TIA Category 6A
 - f. Contact Resistance Variation, maximum 20 mOhm
 - g. Contact Resistance, maximum 100 mOhm
 - h. Current Rating 1.5 A @ 20 °C
 - i. 1.5 A @ 68 °F
 - j. Dielectric Withstand Voltage, RMS, conductive surface 1500 Vac @ 60 Hz
 - k. Dielectric Withstand Voltage, RMS, contact-to-contact 1000 Vac @ 60 Hz
 - l. Insulation Resistance, minimum 500 MOhm
2. Environmental Specifications
 - a. Flammability Rating UL 94 V-0
 - b. Operating Temperature -10 °C to +60 °C (+14 °F to +140 °F)
 - c. Relative Humidity Up to 95%, non-condensing
 - d. Safety Standard cUL | UL
 - e. Storage Temperature -40 °C to +70 °C (-40 °F to +158 °F)
3. General Specifications
 - a. Cable Type U/UTP (unshielded)
 - b. Color:
 - 1) Data: Blue
 - 2) Security Camera: Green
4. Mechanical Specifications
 - a. Conductor Gauge, solid 22 AWG, 24 AWG, 26 AWG
 - b. Conductor Gauge, stranded 22 AWG, 24 AWG
 - c. Conductor Type Solid, Stranded (7 strands)
 - d. Material Type Copper alloy, High-impact, flame retardant, thermoplastic
 - e. Outlet/Module Contact Plating Gold over nickel
 - f. Plug Insertion Life Test Plug IEC 60603-7 compliant plug
 - g. Plug Insertion Life, minimum 750 times

- h. Plug Retention Force, minimum 30 lbf, 133 N
 - i. Rear Termination Contact Plating Gold over nickel
 - j. Rear Termination Type IDC
 - k. Wiring Scheme T568B
 - 5. Regulatory Compliance/Certifications
 - a. RoHS 2002/95/EC Compliant
 - b. ISO 9001: 2008. Designed, manufactured and/or distributed under this quality management system
 - 6. Manufacturers - Category 6A jacks
 - a. Commscope
 - b. Or equal
 - 7. Manufacturers - Blank Module.
 - a. Commscope
 - b. Or equal
- B. Telecommunications Outlets, New, Copper Jacks, Wall Mount, Flush
 - 1. Drawing Reference: MMP4
 - 2. Assembly. Provide complete telecommunications outlet assembly, including but not limited to:
 - a. Faceplate with City standard openings
 - b. Blank connector modules at faceplate openings not filled with connector modules.
 - c. Labels and label holders.
 - 3. Construction
 - a. Plastic - Color to match surrounding electrical plates in room.
 - 4. Faceplate.
 - a. Features.
 - 1) Single gang.
 - 2) Openings for up to 4 jack connector modules MMP4.
 - 3) Label holders with space to label the plate number and the number of each jack.
 - 5. Manufacturer:
 - a. Commscope
 - b. Or equal
- C. Patch Cords
 - 1. Small Diameter Category 6A Patch Cords – One patch cord per patch panel port. Verify length of patch cords required after patch panels and switches have been installed. One patch cord per station jack including WAPs and CCTV cameras. Verify length of patch cords required in the field and to be confirmed after furniture or device installation. Exact counts to be coordinated with City ITS before ordering. Provide 10% of the total count for spare.
 - a. Color
 - 1) Data: Blue

- 2) Security Camera: Green
- 2. Manufacturers:
 - a. Commscope MiNo6A Cat 6A Reduced-Diameter Patch Cord.
 - b. Or equal

PART 3 EXECUTION

3.01 SIGNAL POLARITY AND COLOR CODE CONVENTION

- A. Prepare with Category 6A Station Wire, RJ45 - Per EIA/TIA-568, designation T568B.

3.02 STATION CABLE INSTALLATION AND TERMINATION PROCEDURES

- A. General:
 - 1. All station cable, between the station outlets and the IDF terminal blocks, shall be continuous unspliced runs.
 - 2. Station cable shall run loose throughout all pathways. At no time shall any station cable be secured by a tywrap, electrical tape or similar bindings. If bundling for directional change, plenum rated Velcro shall be used.
- B. Run Lengths:
 - 1. Station, Horizontal and IDF Links:
 - a. Horizontal Distribution runs (including vertical portions) shall not exceed 295 feet from station outlet to the associated communications closet.
 - b. IDF room distribution wiring not to exceed 19.5 feet
 - c. Alternately, total length not to exceed 328 feet.
 - d. Report to the City's Representative conditions exceeding these requirements.
 - 2. Limit cable bends to a minimum radius of 8 times cable diameter except where otherwise noted herein.
 - 3. Service loop at Station
 - a. Copper. Provide ten feet (10') service loop at each station, suspended on a J-hook directly above the outlet. This is to allow the Modular Communications Unit to be removed from the outlet box and visually inspected without leaving so much wire in the box that it might become accidentally damaged during installation. Contractor to field verify the performance of the proposed installation in a mockup using the proposed cabling, jacks, raceway and listed test equipment prior to proceeding.
 - 4. Termination of wiring at the station outlet:
 - a. All data and voice station cable shall be terminated at the individual receptacle modules in accordance with EIA/TIA-568-B, assignment T568B.
 - b. Termination of wiring at existing station outlets:
 - 1) Install in data and voice inserts in place of existing blank insert in existing faceplate.
 - 2) Install new labels and label holders.

5. Termination of station wiring at the IDF
 - a. For the installation/layout of station cable within the IDF rooms, see detail on drawings.
 - b. All Category 6A station cables entering the IDF room will be terminated on a Category 6A RJ45 jack mounted in a Patch Panel as specified in Section 27 11 19 – Communications Termination Blocks and Patch Panels.
 - c. Termination shall begin at the upper left corner of the patch panel and proceed to the right continuing down, left to right until all cables are terminated.

END OF SECTION

SECTION 28 05 00

COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Conditions and Division 1 Specification Sections, apply to this Section.
- B. Provisions of this Section apply to Electronic Safety and Security Work, including the following Sections:
 - 1. Section 28 05 13 – Conductors and Cables for Electronic Safety and Security
 - 2. Section 28 05 28 – Pathways for Electronic Safety and Security

1.2 SCOPE OF WORK

- A. Section includes, but is not necessarily limited to:
 - 1. Common standards and procedures for the Electronic Safety and Security Work.
 - 2. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of the Work of this Division. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction.
 - 3. **Two workstations with access to a touch screen monitor that manages the doors/intercoms. (One at the CORPUS desk and one near the existing PLC console)**
 - 4. **Restriction of doors that only one door can be opened at a time.**
 - 5. **An audible alert when a door is opened.**
 - 6. **A visual indicator that a door is open.**
 - 7. **The door control panel should work in concert with the intercom and the camera. (i.e. when we activate an intercom to speak, it should pull up the nearest camera. Or when we open a door, there should be a two-step process, select the door, which opens a camera view, then a confirmation to actually open the door.)**
 - 8. **Create a log of doors opening and closing that can be audited.**
 - 9. **When an intercom is activated, there should be an audible and visual indicator. Include the ability to mute individual alerts, but retain the visual.**
 - 10. **The system must be on a closed network, but the availability to “flip a switch” to connect to the outside world for remote maintenance. The switch access needs an audible and visual indicator.**
 - 11. **Emergency ability to override and open all doors. This would require at least a two-step process or greater to activate.**


Addendum 4

12. **Provide an Ignition platform by Inductive Automation with unlimited tags and client licenses running on redundant servers.**
13. **The systems must integrate door controls, intercom calls, cameras and other network connected devices with an open communication protocol.**
14. **Provide a Harding DCC digital intercom controller, Intercom Master station at the workstations, integrated with the HMI. Upgrade intercoms to digital control using existing field stations but replace all head end hardware. Incorporate camera call-ups.**
15. **Provide new PLC equipment to control and monitor detention doors with sufficient IO for existing controlled devices. Replace all relays and terminals.**
16. **Provide integration with the Jail management system to the HMI for the following:**
 - a. **Ability to retrieve inmate information by cell assignment**
 - b. **Ability to locate cell assignment by inmate name.**
 - c. **Monitor for control room to display inmate information including classification and relevant notes.**

1.3 REFERENCES

- A. Conform to the applicable portions of the following standards agencies:
 1. UNDERWRITERS LABORATORIES (UL)
 - a. UL 294 (1999; Rev thru Oct 2001) Access Control System Units
 - b. UL 639 (1997; Rev thru Sep 2002) Intrusion Detection Units

1.4 DEFINITIONS

- A. See also Section 27 05 00 – Common Work Results for Communications.
- B. General Abbreviations used in these specifications. Refer additionally to the abbreviations list appearing on the Drawings.
 1. ADA Americans With Disabilities Act.
 2. AFC Above Finished Ceiling.
 3. AFF Above the Finished Floor.
 4. BLDG Building
 5. CAT Category
 6. CL Centerline
 7. DIV Division
 8. (E) Existing
 9. FBO Furnished By City
 10. HR Home Run

11.	ID	Inside Diameter
12.	LAN	Local Area Network
13.	MAX	Maximum
14.	NIC	Not In Contract.
15.	OD	Outside Diameter
16.	OFE	City Furnished Equipment.
17.	PSRH	Project Standard Receptacle Height.
18.	PSSH	Project Standard Switch Height.
19.	TYP	Typical
20.	UON	Unless Otherwise Noted.

C. Definitions of Terms:

1. As defined in Section 28 13 00 – Access Control and Alarm Systems.

1.5 SUBMITTALS

A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.

B. General Requirements

1. Submit all materials for review arranged in same order as Specifications, individually referenced to Specification Section, Paragraph and Contract Drawing number. Conform in every detail as applies to each referencing Section.
2. Submit 8 ½"x 11" items bound in volumes and drawings in edge bound sets. Submit all drawings on sheets of the same size.
3. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.

C. Contractor and Key Personnel Experience.

1. A minimum of 30 days prior to installation, submit documentation of the experience of the Electronic Safety and Security contractor(s) and of their key personnel.
2. Qualifications shall be provided for:
 - a. Electronic Safety and Security contractor(s),
 - b. Electronic Safety and Security installers,
 - c. Supervisor(s) (if different from the installers).
3. Refer to Quality Assurance paragraph in this section for complete requirements.

D. Progress Schedule: Comply with Section 01 32 13 - Project Coordination.

E. Manufacturer's Product Data:

1. Manufacturer's Product Data Sheets. Collate in sequence of List of Materials:
2. Data sheet for each item in each Electronic Security Section, including all accessories, clearly marked for proposed product required for the Project, to including but not limited to the following where required by the Project scope:
 - a. Common Work
 - 1) Power Supplies
 - 2) UPS's
 - 3) Switches
 - 4) Relays
 - 5) Batteries
 - 6) Tamper resistant security fasteners
 - 7) Terminal blocks
 - 8) End-of-Line Resistors.
 - b. Wiring
 - 1) Cabling of each type used on the project.
 - c. Racks and Cabinets (where provided under the work of Division 28).
 - d. Electronic Security Systems Pathway
 - 1) Raceway
 - 2) Raceway connectors
 - 3) Gutter
 - 4) Terminal Cans, Pull Boxes, Device Boxes
 - 5) Enclosures
 - 6) Means of support
 - e. Access Control and Intrusion Device Field Devices
 - 1) Door position sensors
 - 2) Request to exit devices
3. Material Safety Data Sheet, where applies.
4. List of Materials Schedule. For each item, include:
 - a. Referencing Specification Section
 - b. Referencing Paragraph
 - c. Referencing Drawing, if specified only on plans
 - d. Manufacturer.
 - e. Model number.
 - f. Listing, including name of Nationally Recognized Testing Laboratory.

- g. Precede each submittal book with a summary schedule, with columns for each item above and rows for each item submitted.

1) Example:

Specification Section	Paragraph	Contract Drawing Reference	Manufacturer	Model No.	UL/CLA Listed
28 05 00	2.03C		XYZ	123	Y
28 13 00	2.07A1		AAA	34-56	Y
		T2.01	ZZY	456	Y

F. Functional description, provide

1. A system description, including analysis and calculations used in sizing equipment required.
2. Description to show how the equipment shall operate as a system to meet the performance requirements. The following information shall be supplied as a minimum:
 - a. Description of site equipment and its configuration
 - b. Protocol description
3. Startup operations
4. System expansion capability and method of implementation
5. System power requirements and UPS sizing

G. Field (Installation) and Shop Drawings: Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. Collate in sequence at least the following plans:

1. Drawing index/symbol sheet.
2. Floor plans. At scale of Contract Documents. Show:
 - a. Device locations, type and circuit number(s).
 - b. Mounting height.
 - c. Conduit size.
 - d. Rough-in.
 - e. Wire type.
 - f. Wire fill.
 - g. Termination rooms, including BDF and IDF Closets where use of these spaces are indicated on the Bid Documents
3. Sections/Elevations: At scale of Contract Documents:
 - a. Mounting location reference.

- b. Terminal cabinets.
 - c. Electrical power receptacles required for the work of this Section.
 - d. Block wiring terminations
 - e. Clearances
 - f. Backboard Wire and Cable Management
 - g. Electrical and Mechanical panels, including panel boards, EMS and fire alarm, and mechanical systems in vicinity of the work of these Sections.
- 4. System Conduit Riser Drawing. Submit drawings that clearly and completely indicate the function of each Electronic Safety and Security component. Indicate termination points of devices, and interconnections required for system operation. Indicate interconnection between modules and devices. Show:
 - a. Terminal cabinets.
 - b. Coordination with floor plans.
- 5. Single line diagram of Electronic Security and Safety Systems. Indicate the relationship of integrated components on one diagram and show power source, system controls, impedance matches; plus number, size, identification, and maximum lengths of interconnecting wires.
 - a. Show at least:
 - 1) Equipment: Function, make, model.
 - 2) Rack number.
 - b. Grounding and bonding scheme
 - c. Terminal cabinets.
 - d. Coordination with floor plans.
- 6. Mounting details:
 - a. Identify each item requiring seismic restraint installation in accordance with CBC Chapter 16. Include floor mounted items weighing more than 400 pounds and wall mounted or suspended items weighing more than 20 pounds.
 - b. Supports for such items shall be provided support, bracing, and anchorage, designed by the Contractor in accordance with the following criteria:
 - 1) Design to resist seismic forces in accordance with CBC Chapter 16.
 - 2) Minimum Design Parameters - As defined for the Project in Division, with respect to Occupancy Category, Site Classification, Seismic Design Category, Importance Factor, Spectral Acceleration and SDI.
 - c. Specific details of restraints including anchor bolts submitted under the Section 27 05 29 – Hangers and Supports for Communications Systems for mounting and maximum loading at each location, showing compliance and coordination with Code and the project Architectural, Structural and Mechanical Documents.
 - d. Stamped and signed by an Engineer licensed in the Project jurisdiction for work of this type.

- 1) Submit an accompanying Engineering analysis stamped and signed by an Engineer licensed in California for work of this type, indicating that the Equipment Enclosure System will comply with California Building Code for the Project Seismic Zone when loaded with the weight of the equipment submitted.
- 2) Show calculations on drawings or in bound volume for review by Authorities having jurisdiction.
- e. Show loads, type and strength of connections, sizes, dimensions, materials, etc.
- f. Provide details for:
 - 1) Equipment Rack anchorage.
7. Installation details
 - a. Terminal cabinets: Draw elevations of terminal blocks corresponding to the Single Line Diagram.
 - b. Firestopping,
 - c. Details of flexible raceway connections to be made to vibrating equipment
 - d. Details of J-Box and sealant application for the typical conditions listed in Section 27 05 48 – Noise and Vibration Controls for Communications Systems.
 - e. California Access Compliance Manual and Americans with Disabilities Act (ADA) compliance.
8. Fabrication details
 - a. Receptacles.
 - b. Panels.
 - c. Special mounting provisions
 - d. Legends/engraving details. Half or full size:
9. Schedules of Application
 - a. An itemized list of all items of equipment to be fitted with flexible electrical connections.
 - b. Catalog cuts of the products to be applied as J-Box mastic and Acoustical Sealant, and a schedule of rooms to receive application of mastic and sealant at J-Boxes.
- H. Test plan
 1. Project Site Test Reports:
 - a. Schedule: Submit test reports in timely manner relative to Project schedule such that the City's Representative may conduct verification of submitted test data without delay of scheduled progress.
 - b. Project Site test report: Submit following system completion and prior to and as condition precedent to Acceptance Review and Testing of the Work of this Section.
 - c. Content: Include at least:

- 1) Time and date of test.
 - 2) Personnel conducting test.
 - 3) Test equipment, including serial and date of calibration.
 - 4) Test object.
 - 5) Procedure used.
 - 6) Results of test
 - 7) Numerical or graphical presentation.
 - 8) Electronic file in format and media directed by the City's Representative.
- d. Refer additionally to the requirements of Part 3 of this Section and of the individual Electronic Safety and Security Sections.

- I. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the City, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.
- J. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions using format in Division 1 Section "Closeout Procedures".

1.6 QUALITY ASSURANCE

- A. Procedures: In accordance with Section 01 45 00 - Quality Control.
- B. Qualifications

1. Installer's Qualifications

- a. Prior to installation, submit data of the installer's experience and qualifications. Show that the installer who will perform the work has a minimum of 2 years experience successfully installing Electronic Safety and Security Systems of the same type and design as specified herein. Include the names, locations, and points of contact of at least two installations of the same type and design as specified herein where the installer has installed such systems.
- b. Indicate the type of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 12 months.
- c. Security Contractor must be a certified Avigilon Dealer in order to certify the installation of the ~~ACS~~ and VMS in the PSB Detention Area.


Addendum 4

- C. Designated Supervisor: Provide a designated supervisor present and in responsible charge in the fabrication shop and on the Project Site during all phases of installation and testing of the Work of this Section. This supervisor shall be the same individual through the execution of the Work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.
- D. Reference Documents: At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies.

1. A complete set of the latest stamped, actioned submittals of record.
2. A complete set of manufacturer's original operation, instruction and service manuals for each equipment item.

E. Test Equipment

1. Requirements:
 - a. Maintain and operate test equipment at the fabrication shop and the job site for both routine and Acceptance Testing of the Work of this Section.
 - b. Maintain test equipment at the job site while work is in progress from installation of equipment racks until City Acceptance of this Work; thereafter remove all of this test equipment from the job site.
 - c. Unless otherwise indicated, test equipment shall remain property of the Contractor.
 - d. Provide all required test cables, jigs and adapters.
 - e. Provide equipment with traceable calibration, with calibration date not greater than one year prior to the date of the use of the equipment to perform the specified testing.
2. Equipment: Specified in individual Sections.

F. Standard Products

1. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section. All components must be of new condition, used or reconditioned products will not be accepted.
 - a. Alternative Qualifications. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
2. Material and Equipment Manufacturing Date
 - a. Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

G. Manufacturer's identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.

1. Evidence of "patching" after removal of tags or marks is not acceptable.

1.7 REGULATORY REQUIREMENTS

- A. Regulations Applicable: Including but not limited to those defined in Section 01 41 00 - Regulatory Requirements.
 - 1. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
 - 2. Safety Agency Listing: All devices provided under the Work of this Section which are connected to the Project electrical system shall be listed by a Nationally Recognized Testing Laboratory, and shall be so labeled.
 - 3. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the City's Representative. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Procedures:
 - 1. In accordance with General Conditions and Division 1 Section "Product Requirements", as specified in the individual sections of Division 27 and the following.
- B. General
 - 1. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for cabling and equipment placed in storage.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Connecting hardware shall be rated for operation under ambient conditions of 32 to 140 degrees F and in the range of 0 to 95 percent relative humidity, non-condensing.

1.10 SEQUENCING

- A. Comply with Section 01 10 00 - Summary and Section 01 32 16 – Project Schedules.

1.11 OPERATING AND MAINTENANCE DATA

- A. Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance of products provided as a part of the Electronic Safety and Security cabling and pathway system. Precede the manuals with a systems narrative specific to this Project, outlining the major systems functionality, the major systems components, and identifying which manuals document the performance of which subsystems.
 - 1. Submit operations and maintenance data in accordance with Section 01 78 30 - Guarantees Bonds Service and Maintenance Contracts and as specified herein not later than 2 months prior to the date of beneficial occupancy.
- B. Spare Parts

1. In addition to the requirements of Section 01 78 30 - Guarantees Bonds Service and Maintenance Contracts, provide a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.

1.12 PROJECT RECORD DOCUMENTS

- A. Comply with 01 78 00 - Closeout Submittals, and the following.

1. Record Drawings

- a. Content

- 1) Provide a least as required for the Shop and Installation Drawings defined elsewhere in this Section.
 - 2) Contractor shall be responsible for updating building and Electronic Safety and Security plans to reflect as-built conditions.
 - 3) Indicate actual work on Drawings; indicate actual products used, replace vendor neutral nomenclature used in bid set with makes and models of actual installed devices.

- b. CAD.

- 1) Use a computer aided drafting (CAD) system in the preparation of record drawings for this Project. CAD system shall produce files in AutoCAD® .DWG format, latest release at time of Project bid closure. Campus Standard, no substitution permitted.
 - 2) Except where prohibited by Contract, City's Representative will furnish CAD backgrounds in AutoCAD® .DWG format, for use by the Contractor in preparing Record Drawings.

1.13 WARRANTY SERVICE

- A. In addition to provisions of General Conditions and Division 1 Section "Product Requirements", provide the following.

1. Response Time:

- a. Provide an access control manufacturer qualified technician familiar with the work at the Project Site within 24 hours after receipt of a notice of non-emergency malfunction.
 - b. Provide an access control manufacturer qualified technician familiar with the work at the Project Site within 4 hours after receipt of a notice of an emergency malfunction. An emergency malfunction is defined as one causing gate or door openings to be either inaccessible or unsecured.
 - c. Provide the City's Representative with telephone number attended 8 hours a day, 7 days a week, to be called in the event of a malfunction.

- B. Provide all additional Warranties as defined in each Electronic Safety and Security Systems Section.

1.14 CLOSEOUT

- A. Punch List: Perform any and all remedial work, at no claim for additional cost or time. Where required, retest and submit Test Report. Notify the City's Representative of completion of Punch List.

- B. Portable Equipment: Furnish all portable equipment and spares to the City's Representative, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packing.
- C. Operating and Maintenance Data: Install framed operating and maintenance instructions. Submit Manuals.
- D. Project Record Documents: Submit print and digital copies. Digital files shall be in AutoCAD .dwg format, latest release at time of Project bidding..
- E. Keys: If applicable, replace construction locks with permanent locks. Provide 5 sets of keys to the City's Representative.
- F. Instruction: Conduct specified instruction.
- G. Warranty: Submit Warranty dated to run from date of Substantial Completion of the Project.

PART 2 - PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the City.

2.2 GENERAL

- A. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.
- B. Each material, device or piece of equipment shall comply with all of the manufacturer's current published specifications for that item.
- C. Products shall be made by manufacturers regularly engaged in the production of such products.
- D. Provide quantity as shown on Contract Drawings, or as otherwise indicated.
- E. Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.
- F. Unless recycled content is specified, provide new materials.
- G. Provide the manufacturer's latest design/model, permanently labeled with the manufacturer's name, model number and serial number.
- H. Where products are of similar type or use, provide products of the same manufacturer, unless otherwise indicated.
- I. Components

1. UL or third party certified. Cabling and interconnecting hardware and components for Electronic Safety and Security systems shall be UL listed or third party independent testing laboratory certified, and shall comply with NFPA 70 and conform to the requirements specified herein.
2. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance.
 - a. The label or listing by the specified organization will be acceptable evidence of compliance.
 - b. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the City's Representative.
 - c. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

J. Enclosures:

1. Provide steel frames and enclosures designed and wired to eliminate all induced currents.
2. Make bolted connections with self-locking devices.
3. All enclosures should be appropriate to environment of installation – refer to the requirements of Section 28 05 28 – Pathways for Electronic Safety and Security.

K. Finishes: Any item or component of the Work of this Section which is visible shall comply with the following.

1. Finishes noted or scheduled on the Contract Drawings take precedence.
2. Where design location requires that products, materials or equipment are visible to the public, no manufacturer's logos larger than 1/2 inch shall be visible. Unless otherwise noted or directed, neatly remove or permanently paint out such logos.
3. Where finishes are not noted or otherwise defined in the Contract Documents, submit manufacturer's standard finish samples for selection by the City's Representative.

2.3 LABELING

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Unless otherwise indicated, provide black text on a white background.
- C. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- D. Manufacturers
 1. Brother P-Touch
 2. Brady
 3. Or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing conditions before starting work. Submit conflicts in a timely manner for resolution

3.2 GENERAL

- A. Conform to UL 681, UL 1037, and UL 1076, the appropriate installation manual and the requirements of each specification section for each equipment type, whichever is most restrictive. Components within the system shall be configured with appropriate "service points" to pinpoint system trouble in less than 20 minutes.

3.3 PREPARATION

- A. Prepare and sequence the work to minimize disruption to each room environment and any existing Electronic Safety and Security systems.
- B. Protection: Cover all computers, electronic equipment, desks, chairs, furniture and other articles when working at ceiling level and/or performing dust producing tasks.

3.4 LABELING

- A. Field devices: Each Electronic Security System initiating device and each annunciating device shall be labeled with the assigned ID matching the device ID used in the Access Control programming and set-up screens.
 - 1. The ID shall incorporate the device abbreviation, the architectural door number and a sequential number assigned to each device of the same type occurring at the door opening in the form Door Number - Device Abbreviation – Sequential Number - .
 - a. Example: One LA at door number 101A: 101A-LA-1.
 - b. Example: Two DO's at door 121: 121-DO-1, 121-DO-2.
 - 2. Apply label to an unobtrusive spot on the device, cut to minimum practical size before applying.
- B. Panels. Attach to the interior of each control a panel clear plastic holder in this holder place a laser printed list of the door and card reader relay points zone numbers and other signals that may be transmitted to the central station, the type of device, exactly what the alarm and restoral signals indicate. This list shall be typed on 8-½" x 11" paper provide a copy of these list(s) in Microsoft Word on electronic media format delivered to the City's Representative.

3.5 REPAIR AND RESTORATION

- A. Where working in spaces occupied by the City, return to their original positions any furniture or articles relocated to perform the work.

3.6 CLEANING

- A. Where working in spaces occupied by the City:
 - 1. Immediately after completing work within each space, clean up and remove all materials, scrap and dust.

2. All scrap material in work area shall be picked up and removed from the building at the end of each day. See also Division 1 for additional requirements.
3. All dust resulting from work performed shall be vacuumed up daily.
4. All scrap material shall be removed from Site and disposed of in an authorized disposal site. Refer to Section 01 74 19 - Construction Waste Management and Disposal.

3.7 SYSTEMS PERFORMANCE TESTING AND ADJUSTING PROCEDURES

A. General Procedures

1. It shall be the responsibility of the Security Contractor to demonstrate to the City's Representative that the security system is complete and functional as per these specifications. For intrusion detection field devices test shall ensure that the requisite degree of intrusion detection is provided.
2. Acceptance testing shall be scheduled by the Security Contractor thorough established project channels
3. Furnish all necessary instruments and equipment required for conducting tests.

B. Device Level Tests

1. Initially, test each sensor and subsystem component individually.
2. Test all wire for shorts, open circuits, or grounding.
3. Immediately correct any defective work

C. Systems Tests.

1. When the function of each component within a particular subsystem such as each sensor within a particular zone is verified, certify that subsystem of the entire Electronic Safety and Security System is satisfactorily meeting required specifications. Test each subsystem similarly until each detection zone has been certified.
2. When subsystem certification is complete, test entire integrated system to ensure that subsystem elements are compatible and function as a complete system. Integrated system test shall be accomplished in linear fashion, end-to-end, and shall verify that each simulated intrusion performed within each detection zone produces an appropriate alarm or signal.
3. Integrated system test shall also verify that alarm is correctly annunciated at the terminal block associated with the field devices,

D. Contractor Testing

1. Provide for approval, not later than 30 days prior to formal inspection and test, a detailed operational test plan of how each component, subsystem, and entire Electronic Safety and Security System will be tested.
2. Submit a written test report from an authorized representative of the equipment manufacturer that the system has been 100% tested and approved. Submit prior to request for final payment.

3. Test each individual circuit and device for proper operation in the presence of telecommunications personnel. Correct all failures and retest at contractors expense to verify corrections. Correct as built drawings, O & M manuals, programming sheets and system programming to reflect the City's final occupancy room numbers.
4. Provide City's Acceptance Form with a check box associated with each card reader and input point. A check mark in the box will indicate that each point has been correctly installed and that communication between the controller and the server has been established. This form shall be completed prior to City acceptance of the system.

3.8 COMMISSIONING AND ACCEPTANCE

A. General:

1. Upon completion of the work, remove excess debris, materials, equipment, apparatus, tools and similar items. Leave the premises clean, neat and orderly.

B. Results Expected:

1. Electronic Security Systems shall be complete and ready for use.
2. Testing, start-up and cleaning work shall be complete.
3. Maintenance Materials: Special tools for proper operation and maintenance of the equipment provided under this Specification shall be delivered to the City.

C. Inspections

1. There shall be three phases of commissioning inspections:
 - a. Rough-in inspection
 - b. Above-ceiling inspection (after cables are placed)
 - c. Final inspection and testing
2. The Contractor shall verify that the installation and materials used have been inspected before they are enclosed within building features, or otherwise hidden from view. The Contractor shall bear costs associated with uncovering or exposing installations or features that have not been inspected and approved.

D. Rough-in inspection. Once electrical rough-in and pathways have been installed, but prior to walls and ceilings being installed, the Contractor shall request of the City's Representative, in writing, for the official rough-in inspection to take place. The City's Representative will then schedule a time to be on-site to conduct this inspection.

1. At a minimum, the City's Representative will evaluate the following items:
 - a. Accurate location and height above finished floor for all outlet boxes.
 - b. Accurate dimensions (particularly depth) of all outlet boxes and diameter of in-wall conduit serving outlet boxes.
 - c. Gutter size, location and clearance.
 - d. Location and size of all other electronic security systems conduits or pathways.
 - e. Location, spacing and clearance of and around electronic security systems racks and wall-mounted equipment.

- f. That electronic security systems hard wired power and power receptacles, where installed under the work of this project, meet the design requirements.
 2. The City's Representative is then to issue a written report to the Contractor identifying all items which currently do not meet the construction document requirements. All items are to be resolved prior to walls and ceilings being closed up. This report is not necessarily all-inclusive; should issues be discovered later in the project, the Contractor is still responsible for corrections/repairs.
- E. Above-ceiling inspection
 1. Once all electronic security systems cabling has been installed and properly supported and walls have been painted, but prior to the installation of ceiling tiles/material, contractor shall request of the design team, in writing, for the official above-ceiling inspection. The City's Representative will then schedule a time to be on-site to conduct this inspection
 2. At a minimum, the City's Representative will evaluate the following items:
 - a. That all items from the previous inspection have been corrected.
 - b. That electronic security systems cabling is routed correctly and adequately supported.
 - c. That electronic security systems cabling is not painted or over-sprayed.
 - d. That the installed electronic security systems cabling matches what was specified/submitted.
 - e. That there are no kinks, splices, or other damage to the installed electronic security systems cabling.
 - f. That all field devices are properly supported, oriented and labeled.
 - g. That all penetrations through fire-rated walls are properly firestopped, including fire blocking materials installed in the annular spaces; and that the firestops are properly labeled.
 3. The City's Representative is then to issue a written report to the Contractor identifying all items which currently do not meet the construction document requirements. This report is not necessarily all-inclusive; should issues be discovered later in the project, the appropriate communications subcontractor is still responsible for corrections/repairs.
- F. Acceptance Review and Testing Procedures
 1. The City's Representative will witness formal Acceptance Tests after receipt of written certification that all prior Punch List work is complete and that Contractor's functionality tests have been completed and that system is ready for final inspection. This request shall be made 3 weeks before substantial completion. The City's Representative will then schedule a time to be on-site to conduct this inspection.
 2. The Contractor shall provide the following for the acceptance testing.
 - a. Personnel: Provide services of the designated supervisor, ACAS manufacturer representative and additional manufacturer qualified technicians familiar with

- work of this Project. Provide quantity of technicians as required to comply with Project Schedule.
- b. All tools appropriate for performance of adjustment of and corrections to this Work. Include spare wire and connectors and specified tooling for application.
 - c. Ladders, scaffolding and/or lifts as required to access high devices.
 - d. All test equipment.
 - e. Complete set of latest stamped, actioned submittals of record for reference.
 - f. Complete set of Test Reports.
 - g. Complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.
3. The Contractor shall execute the test plan required in Submittals section and as approved and/or modified by the City's Representative. The testing must demonstrate complete operation of all systems and equipment, including any portable equipment.
 4. These procedures may be performed at any hour of the day or night as required by the City's Representative to comply with the Project Schedule and avoid conflict with City staff or student activities. Provide all specified personnel and equipment at any time without claim for additional cost or time.
 5. At a minimum, the City's Representative will check the following items:
 - a. Mechanical/Physical Installation.
 - 1) That all items from the previous inspections have been corrected.
 - 2) That all electronic security systems equipment and cabling terminal rooms is installed per the contract documents, including all required terminal blocks, pull boxes, termination resistors and electronic security systems grounding.
 - 3) All other items necessary to guarantee contract documents are met and complete and functioning communications systems are installed.
 - 4) All cables and electronic security systems field devices and pathway are properly labeled.
 - 5) All penetrations through fire-rated walls are properly fire-stopped, including fire blocking materials installed in the annular spaces; and that the firestops are properly labeled.
 - b. Functionality Demonstration
 - 1) Demonstrate functionality of each installed device is consistent with the read range, sensitivity and immunity to false alarms as specified by the device manufacturer.
 - 2) Functional demonstration to also include, but not limited to the following active components and all related items installed under the work of the project:
 - a) Batteries
 - b) Cameras
 - c) Card readers

- d) Door position sensors
- e) Duress alarm components
- f) Electrified hinges
- g) Electrified latches
- h) Electrified strikes
- i) Glass break sensors
- j) Key pad controllers
- k) Local alarm devices
- l) Motion detectors
- m) Power supplies
- n) Relays
- o) Request to exit devices
- p) Servers
- q) Switches
- r) UPS devices

6. Access Control Infrastructure:

- a. Demonstrate that operation of each opening, including access controlled doors and gates. Refer to the System Performance Requirements and Schedule of Programmatic Outcomes by Door Opening in Section 28 13 00 – Access Control and Alarm Systems is in full conformance with the specified functionality, including each C-Cure status item associated with the scheduled UCSC Door Class.

7. Door Position, Window and Hatch Switches

- a. Demonstrate functionality of each device. Demonstrate that operation of each monitored door by 1/2" or less from the fully closed position causes the position switch to change state.

8. Uninterrupted Power Systems:

- a. Disconnect normal power service. Demonstrate that the system remains in full operation for the specified time.

G. Adjust: As directed by the City's Representative.

3.9 POST ACCEPTANCE TEST REMEDIATION

- A. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the City's Representative, in place of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven (7) days prior to the scheduled completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.

B. Correct:

1. In timely manner, correct identified Work of this Section which is incomplete or found not in conformance with the Contract Documents to comply with the Contract Documents, as reasonably determined by the City's Representative.
2. Conduct additional tests to in the presence of the City's representative to demonstrate that system conforms to the Contract Documents.

3.10 **TRAINING**

 Addendum 4

A. **Provide on-site, project-specific training sessions for system operations, maintenance, and programming with designated total hours as follows:**

1.	Electronic Components	3 hours
2.	Video Surveillance (CCTV) System	12 hours
3.	PLC Integrated Control System	14 hours
4.	HMI Control Stations	14 hours
5.	Intercom System	14 hours

B. **All training is to review the existing systems as they apply to the equipment and systems provided under this contract. All personnel being trained are expected to have basic experience for the existing systems.**

C. **Operational Training:**

1. **Train security staff in the operation of the System. Operational training shall include how to monitor and control the systems provided under this contract and how to respond to system events.**

D. **Maintenance Training:**

1. **Train Owner's personnel in the basic user level maintenance and trouble shooting of the System. Structure training to identify the equipment and systems that can be serviced or reset by the on duty building engineer, how to identify systems that have failed or not working, and emergency shutdown procedures.**
2. **Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on preventative, corrective maintenance and reactive maintenance.**

E. **Programming Training:**

1. **Train Owner's personnel in the site-specific programming and software trouble shooting of the System. Training will also include all user programmable features. Conduct training sessions using instructors who have been actively involved throughout construction and who are certified in writing by the manufacturers of the specific systems.**
2. **Provide a combination of classroom sessions supported by audio/visual aids, and field sessions with personnel participating in hands-on for programming changes, software uploading/downloading, trouble shooting, etc.**

- F. **Submit an estimated training schedule 15 days prior to training for approval by the Owner's Representative. Estimate classroom and hands-on hours required for all three types of training (operational, maintenance, and programming). Include a syllabus for each class session.**
- G. **All training materials including Operational and Maintenance (O&M) Manuals shall be reviewed and approved prior to conducting the specific training.**

END OF SECTION

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SECTION 28 05 13

CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes wiring standards for work of Electronic Safety and Security Systems
- B. Related Work Under Other Sections
 - 1. Section 27 10 00 – Structured Cabling, Basic Materials & Methods
 - a. Defines standards and methods for termination of IP-based cabling used for IP cameras and IP work area outlets necessary to support access control systems installed under the work of Division 28.
 - 2. Section 27 15 00 – Communications Horizontal Cabling
 - a. Defines materials and execution standards for installation of TIA/ANSI standard category media installed under the work of Division 27 to provide work area outlets for final connection by the work of Division 28 to cameras and IP alarm system panels.
 - 3. Section 28 05 00 – Common Work Results for Electronic Safety and Security.
 - 4. Section 28 05 26 – Grounding and Bonding For Electronic Safety And Security
 - 5. Section 28 05 28 – Pathways for Electronic Safety And Security

1.3 SUBMITTALS

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

1.4 REFERENCES

- A. National Fire Protection Association (NFPA)
 - 1. NFPA 70 National Electrical Code
- B. Telecommunications Industry Association (ANSI/TIA)
 - 1. ANSI/TIA-568-C.0, Generic Telecommunications Cabling for Customer Premises
 - 2. ANSI/TIA-568-C.1, Commercial Building Telecommunications Cabling Standard, 2009
 - 3. ANSI/TIA-568-C.2, Balanced Twisted-Pair Telecommunication Cabling and Components Standard, published 2009

4. ANSI/TIA 569-C (2012) Telecommunications Pathways and Spaces
5. ANSI/TIA-606-B (2012) Administration Standard Telecommunications Infrastructure
6. ANSI- J-STD-607-B (2011) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

C. Underwriters Laboratories, Inc. (UL)

1. UL 444(2002; Bul. 2002, 2003) Communications Cables
2. UL 1863(2000; R 2004) Communications Circuit Accessories
3. UL 969 (1995; R 2001) Marking and Labeling Systems

1.5 **QUALITY ASSURANCE**

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

1.6 **DELIVERY, STORAGE AND HANDLING**

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

1.7 **WARRANTY**

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

PART 2 - PRODUCTS

2.1 **CABLING**

A. General

1. Where not otherwise specified or indicated, conform to manufacturers most stringent recommendations with respect to pair count, gage, conductor construction and shielding for indicated run length.
2. Conform to Code requirements with respect to acceptable jacket construction for each application and condition. Provide NEC/CEC CMP listed cable construction at plenum at environmental air and underfloor applications.
3. Analog Video Cabling, Copper Coax and Related. Provide cable with electrical conductors of soft drawn annealed copper, bare or tinned, solid or concentric stranded as applies, conductivity not less than 98% of pure copper. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
4. Manufacturers:
 - a. Alpha
 - b. Belden

- c. Commscope/Isotec
- d. West Penn
- e. or equal.

B. Card Reader Cabling

1. Construction:

- a. Conform to Code requirements with respect to acceptable jacket construction for each application and condition
- b. 4 pair
- c. 22 ga. minimum
- d. Overall foil shield with drain wire.
- e. Manufacturers:
 - 1) Belden
 - 2) Alpha
 - 3) Commscope/Isotec
 - 4) West Penn
 - 5) or equal.
- f. Manufacturers, Alternate Construction:
 - 1) Provide Category 6 cabling as specified in Section 27 15 00.

C. Release Button, Door Switch

- 1. 2 stranded conductors, 22-18 gauge minimum
- 2. Manufacturers:
 - a. Belden 8442, 8461, 5300UE, 5500UE, 6300UE, 6500UE
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn
 - e. or equal.

D. Request to Exit, Motion Detector, Glass Break

- 1. 4 stranded conductors, 22-18 gauge minimum
- 2. Manufacturers:
 - a. Belden 5302UE, 5502UE, 6302UE, 6502UE
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn

e. or equal.

E. Combination dual detector

1. 6 stranded conductors, 22-18 gauge minimum
2. Manufacturers:
 - a. Belden 5304UE, 5504UE, 6304UE, 6504UE
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn
 - e. or equal.

F. Lock Power and General Low Voltage Power, Indoor Applications

1. 2 stranded conductors, 16-18 gauge minimum. Size to exceed manufacturers minimum recommendations for voltage drop for required run lengths.
2. Manufacturers:
 - a. Belden 5300UE, 5200UE, 6300UE, 6200UE
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn
 - e. or equal.

G. RS-232 Cabling

1. At least 2-3 pairs, actual pair count as required by interface.
2. 22 gauge minimum, paired construction.
3. Overall foil shield with drain wire
4. Manufacturers:
 - a. Belden 9855, 89855
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn
 - e. or equal.

H. RS-485 Cabling

1. At least 2 pairs, or as required by interface.
2. 18 gauge minimum, paired construction.
3. Overall foil and braid shield with drain wire

4. Manufacturers:
 - a. Belden 9842, 82842
 - b. Alpha
 - c. Commscope/Isotec
 - d. West Penn
 - e. or equal.
- I. Control Cabling, Underground, in ducts
 1. As specified for the applications above with waterblocking construction consisting of two ply tape designed to swell on exposure to water.
 2. Jacket is sunlight and moisture resistant
 3. NEC CM or CL3 listed or better. Transition to listed cabling type within 50 feet of entering building.
 4. Manufacturer listed for underground application subject to extended exposure to standing water.
 5. Manufacturer:
 - a. West Penn Aquaseal
 - b. Alpha
 - c. Belden
 - d. Commscope/Isotec
 - e. or equal.
- J. Cable, Precision Video:
 1. Drawing Reference: PVideo.
 2. Description: 100% sweep tested (0.01 to 100 MHz) double braided shield solid center conductor 75 ohms coaxial precision video cable.
 3. Performance:
 - a. Cable Type: Coaxial precision video.
 - b. Center Conductor AWG: At least twenty (20) bare copper. Copper clad steel center conductors not acceptable. Increase gauge for longer runs as recommended by camera manufacturer.
 - c. Jacket
 - 1) Underground: Flooded, waterblocked. Suitable for continuous immersion in water.
 - 2) Riser and General Applications:
 - 3) Underfloor and in environmental airspace: Plenum
 - d. Insulation: Polyethylene.

- e. Shield: Tinned copper double braid, 95% coverage.
- f. Nominal Impedance: 75 ohms.
- g. Velocity of Propagation: at least 66%.
- h. Maximum Attenuation Per 100':
 - 1) 1 MHz: 0.25 dB
 - 2) 4.5 MHz: 0.45 dB.
 - 3) 10 MHz: 0.78 dB.
- 4. Jacket: Polyethylene.
- 5. Diameter: 0.305" maximum.
- 6. Manufacturers
 - a. Interior Application
 - 1) Belden 8281A, 8281B, 543945, 643948
 - 2) Commscope/Isotek IR201V59
 - 3) West Penn
 - 4) or equal
 - b. Underground Outside Plant, as for above with flooded jacket, at least NEC CM rating.
 - 1) Belden 5339W5
 - 2) Commscope/Isotek
 - 3) West Penn
 - 4) or equal
 - c. Siamese cabling with specified coaxial cable and integral camera control cabling:
 - 1) Belden
 - 2) Commscope/Isotek
 - 3) West Penn
 - 4) or equal

2.2 CABLE TERMINATION DEVICES AND RELATED, NON-CATEGORY RATED

- A. Screw type or Tubular Clamp Barrier Blocks:
 - 1. Buchanan 125, 0625 Series.
 - 2. Electrovert equivalent.
 - 3. TRW Cinch 140, 141, 142 Series.
 - 4. Weidmuller

5. Pass & Seymour/Legrand equivalent.
 6. Phoenix
 7. or equal.
- B. Tubular Clamp Barrier Blocks, High Density, Switch Block Section
1. Drawing Reference: TB15.
 2. Features/Functions
 - a. Paired screw terminals on opposite sides of insulating base.
 - b. TB15 Base mounts to DIN rail, providing space beneath TB15 to dress field and source cabling.
 - c. Terminates range of wire gages used by project – at least 30 gage to 10 gage.
 - d. High density:
 - 1) At least 33 pairs of connections per foot for 12 and smaller gage terminations,
 - 2) At least 16 pairs of connections per foot for 10 gage terminations.
 - e. Switch Block Section permits load, such as field devices, to be separated from monitoring panel for testing independent of source then restored without disturbing field wiring terminations.
 - f. Rated at least fifteen (15) amperes at 300V AC/DC
 3. Approvals
 - a. UL
 4. Manufacturers:
 - a. Allen Bradley Isolation Switch Blocks,
 - 1) 1492-H7 for 30 to 12 gage
 - 2) 1492-CE9 for 10 gage.
 - b. Tyco Buchanan 0135 Series.
 - c. WECO Electrical Connectors
 - d. Altech
 - e. Curtis Industries
 - f. Electrovert
 - g. Weidmuller
 - h. Pass & Seymour/Legrand
 - i. Phoenix
 - j. or equal.

C. Video connector, BNC type, 75 ohms, cord, crimp applied. Coordinate with cable.

1. Amp.
2. Amphenol.
3. Augat/LRC Products
4. Canare.
5. Kings.
6. RFI/Celltronics.
7. Trompeter.
8. or equal.

2.3 PATCH CORDS

A. Category 6A Patch Cords

1. Reference: Cat 6A Patch Cords
2. Features/Function/Construction:
 - a. Manufactured product – field/contractor assembled patch cords not acceptable.
 - b. Manufacturer certified to exceed EIA/TIA 568 C.1 Category 6A performance and construction standards.
 - c. Snagless Boot Covers
 - d. Color: Green, Aqua or Turquoise, unless directed otherwise by the City's Representative. In no event the color of the supplied voice patch cabling match that used by the City furnished data systems patch cords
3. Length: As required to meet function
4. Quantity: As required to meet function
5. Manufacturers:
 - a. Belden
 - b. Belkin
 - c. Leviton
 - d. Systimax/Commscope
 - e. AMP
 - f. Hubbell
 - g. Siemon
 - h. Or equal.

2.4 **ELECTRONIC SECURITY SYSTEMS CABLING LABELS, INTERIOR**

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Provide vinyl substrate with a white printing area and black print. If cable jacket is white, provide cable label with printing area that is any other color than white, preferably orange or yellow – so that the labels are easily distinguishable.
- D. Shall be flexible vinyl or other substrates to apply easy and flex as cables are bent.
- E. Shall use aggressive adhesives that stay attached even to the most difficult to adhere to jacketing.
- F. Manufacturers:
 - 1. Brady
 - 2. Brother
 - 3. Panduit
 - 4. Or equal.

PART 3 - EXECUTION

3.1 **WIRING CLASSIFICATION AND RELATED**

- A. Audio Signal Wiring Classification:
 - 1. Type A-1: Microphone level wiring less than -30 dBu, 20 Hz to 20 kHz.
 - 2. Type A-2: Line level wiring -30 dBu to +24 dBu, 20 Hz to 20 kHz.
 - 3. Type A-3: Loudspeaker level or circuit wiring greater than +24 dBu, from 20 Hz to 20 kHz.
- B. Video and Related Signal Wiring Classification:
 - 1. Type V-1: Baseband and composite video wiring 1 volt peak-to-peak into 75 ohms, 0 to 10.0 MHz.
 - 2. Type V-2: Synchronization and switching pulse wiring 4 volts peak-to-peak into 75 ohms, 15.62 to 15.75 kHz.
 - 3. Type V-3: Color subcarrier wiring 0 to 4 volts peak-to-peak into 75 ohms, 3.57 to 4.43 MHz.
 - 4. Type V-4: MATV system wiring 0.1 to 1000 microVolts peak-to-peak into 50 or 75 ohms, 47 to 890 MHz.
- C. Control Signal Wiring Classifications:
 - 1. Type C-1: DC control wiring 0 to 50 volts.

2. Type C-2: Synchronous control or data wiring 0 to 40 volts, peak-to-peak.
3. Type C-3: AC control wiring 0 to 48 volts, 60 Hz.

D. Additional Wiring Classifications:

1. Type M-1: DC power wiring 0 to 48 volts.
2. Type M-2: AC power wiring greater than 50 volts, 60 Hz.
3. Wiring Combinations:

E. Except as indicated herein, conduit, wireways and cable bundles shall contain only wiring of a single classification. The following combinations are acceptable in conduit, or cable harnesses. Additional acceptable combinations may be indicated on the Drawings.

1. Types A-1, C-1, and M-1.
2. Types A-2, C-1, C-2, and M-1, runs less than 20 feet.
3. Types A-2, C-1, and M-1.
4. Types A-3, C-1, C-2, and M-1.
5. Types A-2, V-1, and V-3.
6. Types V-1, V-2, V-3, and C-1.
7. Types M-2 and C-3.

3.2 WIRING PRACTICE

A. All wiring of Division 28 to be installed in raceway except above accessible ceilings.

1. Separate raceway systems, including backboxes and conduit, shall be provided for to electromagnetically isolate electric lock and door motor operators, local door alarms and other similarly powered sources of electro-magnetic noise from door position switches, card reader, door release buttons, duress alarms and similar low power, electromagnetic noise sensitive applications. Refer to Wiring Classification and Related above and comply.
2. Minimum conduit size for multiple conductor runs shall be $\frac{3}{4}$ ". In each control panel 2 empty $\frac{3}{4}$ " conduits shall be installed for future use. These conduits shall be routed to an accessible area above the ceiling or to a location approved by City. Run circuits for AC separate from circuits using DC. Each supervisory/data loop shall be run separately from any other supervisory/data loops they shall not be permitted to share the same conduit. From security alarm control panel provide one $\frac{3}{4}$ " conduit to nearest telephone backboard or panel location for tie-in to City furnished central station. Provide min 1" conduit to each card access or exterior door, unless otherwise shown or scheduled on the plans
3. Conduits including flexible metal and armored cable shall terminate in the sensor or device enclosure.
4. Ends of conduit shall be fitted with insulated bushings. Exposed conductors at ends of conduits external to sensors and devices are not acceptable.

5. Refer to additional requirements in Section 28 05 28 - Pathways For Electronic Safety And Security.
- B. All field wiring shall run continuous from device to device no splices shall be permitted except at specified terminal blocks installed in lockable termination cabinets.
1. The use of wire nuts and crimp type connectors shall not be permitted.
 2. Where shielded wire is used it shall be connected to an earth ground at the panel. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
 3. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire or cable shall be supported by a connection point.
 4. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
 5. Security alarm conductor terminations in control panels, termination cabinets, junction boxes and annunciator panels to be made on specified terminal strips with a separate point for each conductor.
 - a. All such strips to be number identified as shown in wiring diagram attached to inside of door of control panel.
 - b. Connect wiring neatly to terminals strips.
 - c. Set up termination of cabling so that section of the system may be isolated or shorted out for servicing.
- C. No control panel shall be mounted where is not readily accessible the highest connection point shall not be above 6'6" nor shall the bottom of the panel be below 30".
- D. All necessary interconnections, services, and adjustments required for a complete and operable system shall be provided. All installation work must be done in accordance with the safety requirements set forth in the general requirements of ANSI C2 and NFPA 70.
- E. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- F. Security alarm conductor terminations in control panels and termination panels to be made on terminal strips with a separate point for each conductor. All such strips to be number or labeled identified as shown in wiring diagram attached to inside of door of control panel. Connect wiring neatly to terminals strips. Bundle with nylon cable straps. Set up termination of cabling so that sections of the system may be isolated or shorted out for servicing.
- G. Mount end-of-line resistor for each circuit at the device. Glass break devices may be grouped orderly to a zone. Do not allow glassbreak zones to cover more than one side of the building without approval from City. Connect glass break detectors to C-Cure DGP panel and provide programming of campus C-Cure database to enable remote reset.
- H. Correct unacceptable wiring conditions including but not limited to:
1. Deformed, brittle or cracked insulation.

2. Torn or worn cable jacket.
3. Excessively scored cable jackets.
4. Insulation shrunken or stripped further than 1/8" away from the actual point of connection within a connector, or on a punch block.
5. Ungrommited, unbushed, or uninsulated wire or cable entries.
6. Deformation or improper radius of wire or cable.

3.3 **TERMINATION CABINETS**

- A. Where termination cabinets are used they shall be installed in or on walls. Each termination cabinet shall have a hinged cover with a lock installed flush with the cover. These locks shall be keyed alike. Each termination cabinet shall be marked with a sign with the words "Sec. Termination Cabinet" attached to the front cover. This sign shall be constructed from red laminated plastic with 1/4" white engraved letters.

3.4 **SPLICING**

- A. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
 1. At designated splices, maintain conductor color code across all splices.
 - a. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures.
 - b. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards.

3.5 **PULLING IN**

- A. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.
- B. Inspect all conduit bends to verify proper radius. Comply with Code for minimum permissible radius and maximum permissible deformation.
- C. Apply a chemically inert lubricant to all wire and cable prior to pulling in conduit. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Use multi-spool rollers where cable is pulled in place around bends. Do not pull reverse bends.
- D. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.

3.6 **SUPPORT**

- A. Support: Provide support for all cabling. Conform to the most restrictive of the California Electric Code and Section 28 05 28 Pathways for Electronic Safety and Security. Provide support for all cabling. Conform to the restrictions of the California Electric Code and Section 27 05 29. Secure all wire and cable run vertically for continuous distances greater than thirty (30) feet. Secure robust non-coaxial cables with screw-flange nylon cable ties or similar devices appropriate to weight of cable. For all other cables, provide symmetrical conforming nonmetallic bushings or woven cable grips appropriate to weight of cable.
- B. Separation from sources of Electromagnetic Interference: Conform with the requirements of ANSI/TIA-569-C, 9.3 Pathway Separation from EMI sources. Secure all wire and cable run vertically for continuous distances greater than thirty (30) feet. Secure robust non-coaxial cables with screw-flange nylon cable ties or similar devices appropriate to weight of cable. For all other cables, provide symmetrical conforming nonmetallic bushings or woven cable grips appropriate to weight of cable.
- C. Field Device Wiring
 - 1. Wire each device as a home run from the device the terminal block
 - 2. Loop or Zone wiring not acceptable unless addressable devices are specified and provided. Wire all potential monitoring and signaling points (each pin) of each field device and alarm sensor, including internal tamper sensors.
 - 3. At electric strikes and electric locks, provide end-of-line resistors, diodes or MOV's where device does not already include such components. Document where such devices have been added on As-Built drawings.
- D. Card Reader Wiring
 - 1. Verify that the slack loops called for on the plans are provided.

3.7 **LABELING**

- A. Label each end of each cable to indicate its terminal point.
 - 1. For field devices, use the device label assigned per the requirements of Section 28 05 00 - Common Work Results for Electronic Safety and Security.

END OF SECTION

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SECTION 28 05 28

PATHWAYS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Work In Other Sections. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
 - 1. Section 28 05 00 – Common Work Results for Electronic Safety and Security
 - 2. Section 28 05 13 – Conductors and Cables for Electronic Safety and Security
 - 3. Section 28 05 26 – Grounding and Bonding for Electronic Safety and Security

1.2 SUMMARY

- A. This section includes provision of electronic security systems pathways as specified in this Section and as shown diagrammatically on the plans. Provide electronic security systems pathways in accordance with the CEC, ANSI/TIA-569-C (2012) Telecommunications Pathways and Spaces, as specified in this Section and as shown on the plans, whichever is most restrictive. Provide system furniture pathways in accordance with UL 1286.
- B. Contractor to design complete Electronic Safety and Security pathway system including provision of the following
 - 1. Rigid steel conduit and fittings.
 - 2. Intermediate metal conduit and fittings.
 - 3. Electrical metallic tubing and fittings.
 - 4. Non-metallic raceway and fittings.
 - 5. Flexible metallic conduit and fittings.
 - 6. Liquidtight flexible metallic conduit and fittings.
 - 7. Miscellaneous conduit fittings and products.
 - 8. Junction Boxes
 - 9. Hinged cover enclosures.
 - 10. Pullboxes and Terminal Cabinets.
 - 11. Wireway
 - 12. Strut supports
 - 13. Beam clamps

14. Concrete Fasteners
 15. Touch-Up Materials
 16. Conduit supports.
 17. Equipment supports.
 18. Fastening hardware
- C. Provide fire penetration sealant systems at all rated wall and floor/ceiling penetrations as required. Additionally, provide where indicated, which may be in excess of Code but required to meet City's operational and functional requirements.
- D. At Hazardous Occupancies, installation conforms to the requirements of California Electric Code for Class and Division rating of spaces.
- E. Fastening System Description
1. Provide devices specified in this Section and related Sections for support of electronic safety equipment specified for this Project.
 2. Provide support systems that are adequate for the weight of equipment, conduit and wiring to be supported.
 3. Seismic Design Requirements
 - a. Identify each item requiring seismic restraint installation in accordance with CBC Chapter 16. Include floor mounted items weighing more than 400 pounds and wall mounted or suspended items weighing more than 20 pounds.
 - b. Supports for such items, including racks, conduit, cable trays and similar shall be provided support, bracing, and anchorage, designed by the Contractor in accordance with the following criteria:
 - 1) Design to resist seismic forces in accordance with CBC Chapter 16.
 - 2) Minimum Design Parameters - As defined for the Building, with respect to Occupancy Category, Site Classification, Seismic Design Category, Importance Factor, Spectral Acceleration and SDI.

1.3 REFERENCES

- A. Usage: In accordance with Section 01 41 00 – Regulatory Requirements.
1. American Institute Of Steel Construction (AISC)
 - a. AISC 325 (2005) Steel Construction Manual
 2. American National Standards Institute (ANSI)
 - a. ANSI C80.1 1994 Rigid Steel Conduit - Zinc Coated
 - b. ANSI C80.3 1991 Electrical Metallic Tubing - Zinc Coated
 3. American Society For Testing and Materials (ASTM)

- a. ASTM A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - b. ASTM A153/A153M-04 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - c. ASTM B633-98e1 Specification for Electro-deposited Coatings of Zinc on Iron and Steel.
 - d. ASTM A653/A653M-04a Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. National Electrical Manufacturers Association (NEMA)
- a. NEMA 250-2003 Enclosures for Electrical Equipment (1000 Volts Maximum)
 - b. NEMA FB 1 (ANSI/NEMA FB 1-2003) Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
 - c. FB 2.10 2000 Selection and Installation Guidelines For Fittings For Use With Non-Flexible Metallic Conduit Or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, And Electrical Metallic Tubing).
 - d. FB 2.20 2000 Selection and Installation Guidelines for Fittings for use with Flexible Electrical Conduit and Cable
 - e. NEMA ICS 6 1988 (Rev. 1) Enclosures for Industrial Control and Systems
 - f. NEMA OS 3-2002 Selection and Installation Guidelines for Electrical Outlet Boxes.
 - g. NEMA RN 1-1998 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - h. NEMA TC 7 2000 Smooth Wall Coilable Polyethylene Electrical Plastic Duct
 - i. NEMA TC 13 2000 Electrical Nonmetallic Tubing (ENT).
 - j. NEMA TC 14 1984(R 1986) Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings
5. Underwriters Laboratories, Inc. (UL)
- a. UL 1 2000 Flexible Metal Conduit
 - b. UL 6 2004 Electrical Rigid Metal Conduit - Steel
 - c. UL 50 (1995; R 1999, Bul. 2001) Enclosures for Electrical Equipment
 - d. UL 360 1986 (Bul. 1991) (R 1993) Liquid-Tight Flexible Steel Conduit
 - e. UL 514A 1991 (R 2004) Metallic Outlet Boxes
 - f. UL 514B 1989 (R 2004) Conduit, Tubing and Cable Fittings
 - g. UL 514C 1996 (R 2000) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
 - h. UL 651 1989 (R 1989) (Bul. 1993) Schedule 40 and 80 Rigid PVC Conduit.
 - i. UL 797 1993 (R 2004) Electrical Metallic Tubing - Steel

- j. UL 1242 1983 (R1993) (Bul. 1993) Intermediate Metal Conduit.
- k. UL 1286(1999; R 2001, Bul. 2002) Office Furnishings
- l. UL 1479 Fire Tests of Through Penetration Firestops
- m. UL Fire Resistance Directories

1.4 SUBMITTALS

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification, Section 28 05 00 - Common Work Results for Electronic Safety and Security and the following:
 - 1. As part of the project submittals, the contractor to provide engineered shop drawings indicating the proposed design for mounting all work of this Division as defined under the Seismic Design Requirements and defined elsewhere in this Section, inclusive of mounting systems, equipment mounted at the exterior, inclusive of its effective wind load under the range of conditions expected.
 - a. Shop drawings to be accompanied by anchorage calculations indicating that it shall remain attached to the mounting surface after experiencing forces in conformance with California Code of Regulations, Title 24, 2007 California Building Code.
 - b. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.

1.5 QUALITY ASSURANCE

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.
- B. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- C. Only products and applications listed in this Section may be used on the project unless otherwise submitted and approved by the City's Representative.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

1.7 WARRANTY

- A. Conform with the requirements of Conditions of Construction Contract, Division 1 Specification and Section 28 05 00 - Common Work Results for Electronic Safety and Security.

PART 2 - PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- B. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the City.

1.2 ACCEPTABLE MATERIALS

- A. Products of the manufacturers specified in this section establish the minimum functional, aesthetic and quality standards required for work of this section.

2.2 GENERAL

- A. Provide the following types of conduit systems listed by their commonly used generic name.

2.3 RACEWAY

- A. Manufacturers:

- 1. Raceway:

- a. Allied Tube and Conduit Co.
 - b. Triangle PWC, Inc.
 - c. Western Tube and Conduit Corp.
 - d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Alflex Corp.
 - g. American Flexible Metal Conduit Co.
 - h. Anaconda.
 - i. Or equal.

- 2. Stainless Steel Raceway and Fittings

- a. Calbrite
 - b. Allied Tube and Conduit
 - c. Or equal.

- 3. Fittings:

- a. Appleton Electric Co.
 - b. OZ/Gedney.
 - c. Thomas & Betts Corp.
 - d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Carlon.
 - g. or equal.

- B. Rigid Steel Conduit.

1. Drawing and Spec Reference: RSC.
2. Construction:
 - a. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.
 - b. Compression type couplings, locknuts, bushings, and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure.
 - c. Three piece couplings: Electroplated, cast malleable iron.
 - d. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150 degree C minimum.
 - e. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.
 - f. Insulated metallic bushings: Threaded cast malleable iron body with plastic insulated throat rated 150 degrees C.
 - g. All fittings and connectors shall be threaded.
- C. Coated Rigid Steel Conduit:
 1. Drawing and Spec Reference: CRSC.
 2. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and NEMA RN-1 with nominal 40 mil thermoplastic vinyl coating, heat fused and bonded to the exterior of the conduit.
 3. Fittings:
 - a. Conduit couplings and connectors shall be as specified for galvanized rigid steel conduit and shall be factory PVC coated with an insulating jacket equivalent to that of the coated material.
 - b. Fittings over-sleeve to extend 1 conduit diameter or 1-1/2" beyond fitting, whichever is less.
 4. Performance:
 - a. Tensile Strength: 3500 psi.
 5. Approvals:
 - a. NEMA RN1 (Type 40 - 40 mils thick)
 - b. CalTrans Type 2
 6. Manufacturers:
 - a. Plastibond by RobRoy Industries.
 - b. Occal-40 by Occidental Coating Company.
 - c. KorKap by Plastic Applicators.
 - d. Ocal-Blue
 - e. or equal.

D. Intermediate Metal Conduit

1. Drawing Reference: IMC
2. Conduit: Hot dip galvanized steel meeting the requirements of CEC Article 345 and conforming to ANSI C80.6 and UL 1242.
3. Fittings: Compression type couplings, connector and bushing shall be as specified for galvanized rigid steel conduit. Integral retractable type IMC couplings are also acceptable.

E. Electrical Metallic Tubing.

1. Drawing and Spec Reference: EMT.
2. Conduit: Shall be formed of cold rolled strip steel, electrical resistance welded continuously along the longitudinal seam and hot dip galvanized after fabrication. Conduit shall conform to ANSI C80.3 specifications and shall meet UL classifications.
3. Raintight compression couplings: Electroplate steel or cast malleable iron; UL listed raintight and concrete tight, using gland and ring compression type construction.
4. Raintight compression connectors: Electroplated steel or cast malleable iron, UL listed raintight and concrete tight, with insulated throat, using gland and ring compression type construction.
5. Use of set-screw couplings and connectors is not permitted.

F. Flexible Conduit:

1. Drawing Reference: FLEX
2. Construction:
 - a. Flexible steel, zinc coated on both inside and outside by hot-dipping process.
 - b. Interlocking spirally wound continuous steel strip.
 - c. 3/4" minimum size.
3. Fittings: Compression type connectors shall be of the single screw clamp variety with steel or cast malleable iron bodies and threaded male hubs with insulated throats. Exception: Pressure cast screw-in connectors shall be acceptable for fixture connection in suspended ceilings and cut-in outlet boxes within existing furred walls.
4. Approvals:
 - a. UL 1

G. Liquidtight Flexible Metallic Conduit

1. Drawing Reference: Liquidtight
2. Conduit: Shall be fabricated in continuous lengths from galvanized steel strips, interlocking spirally wound, covered with extruded liquidtight jacket of polyvinyl chloride (PVC) and conforming to UL 360. Provide conduit with a continuous copper-bonding conductor wound spirally between the convolutions.

3. Fittings: Compression type connector body and gland nut shall be of cadmium plated steel or cast malleable iron, with tapered, male, threaded hub; insulated throat and neoprene "O" ring gasket recessed into the face of the stop nut. The clamping gland shall be of molded nylon with an integral brass push-in ferrule.

H. Conduit, Stainless Steel

1. Constructed of Type 316 Stainless Steel with either EMT, IMC type stainless steel fittings.
2. Approvals
 - a. UL6A

I. PVC Conduit

1. Drawing and Spec Reference: PVC.
2. Construction:
 - a. 4" trade diameter, unless otherwise noted.
 - b. Poly-vinyl chloride.
 - c. Schedule by Application
 - 1) Straight segments, Schedule 40.
 - 2) Flat elbows, Schedule 40.
 - 3) Vertical elbows sweep up to grade, Schedule 80.
 - 4) Above grade, Schedule 80.
 - d. Elbows.
 - 1) Where innerduct liner is scheduled – CRSC.
 - 2) Elsewhere, Schedule 80.
 - 3) 90° C rated.
 - 4) Solvent welded joints, joints by pipe manufacturer.
 - e. Application.
 - 1) Soil Backfill/Direct Burial
 - a) RUS Type II, Type C or Type DB
 - b) Schedule 40.
 - 2) Concrete Encasement:
 - c) PVC Type DB-120,
 - d) RUS Type I, Type B or Type EB
 - e) Any meeting Soil Backfill/Direct Burial.
 - 3) Boring
 - f) HDPE.
 - g) RUS Type Flexible Plastic.

- f. Performance:
- 1) Tensile Strength: 7,000 psi at 73.4° F.
 - 2) Flexural Strength: 11,000 psi.
 - 3) Compressive Strength: 8,600 psi.
- g. Approvals:
- 1) RUS Listed for Telephone Cable Installation 5-99 Edition, or latest release thereof.
 - 2) NEMA TC-2, PVC Type EPC-40 and EPC-80.
 - 3) NEMA TC-3.
 - 4) NEMA TC14 Fiberglass Conduit.
 - 5) UL 514 fittings.
 - 6) UL 651.
 - 7) ANSI C33.91.
- h. Manufacturers:
- 1) RUS Listed:

Manufacturer	RUS Listed for	Manufacturer Part Number
Allwire, Inc.	Flexible plastic	ALLDUCT
American Pipe & Plastics	Plastic	Type B, C, and D
	Plastic	Type EB and DB
	Plastic	PVC Multi-Duct (2,3,4 and 6-way)
Americon International	Flexible plastic	HDPE Duct
	Plastic	PVC Type C
Apache Plastics, Inc.	Plastic	Type EB and Type DB
ARMCO	Plastic	Smooth-Cor Type B and Type C
Arncos	Flexible plastic	HDPE Conduit
Bay Plastics, Inc.	Plastic	Type B and Type C
Bristolpipe	Plastic	Type B, C, and D
	Plastic	Type EB and Type DB
Can-Tex	Plastic	Type EB and Type DB
	Plastic	Type B, C, and D
Carlson	Plastic	Type EB and Type DB
	Plastic	Type B, C, and D
	Plastic	Multi-Gard
Certain-Teed Products Corp.	Plastic	Type EB and Type DB
CIBA-GEIGY	Fiberglass	T & D Conduit
Condux International, Inc.	Concrete	Condux
	Plastic	Type EB and Type DB
CSR Polypipe	Flexible plastic	HDPE Duct

Dura-line	Flexible plastic	HDPE Duct
Eagle Pacific Industries, Inc.	Plastic	Type EB and Type DB
	Flexible plastic	HDPE Coiled Duct
Endot Industries	Flexible plastic	HDPE Duct
Freedom Plastics, Inc.	Plastic	Type C
Hercules, Inc.	Flexible plastic	Corflo plastic conduit
Hurlbut Plastic Pipe	Plastic	Type C
Ingomar Plastic Pipe	Plastic	Type B and Type C
J-M Manufacturing Company	Plastic	Types C, EB, and DB
Kyova	Plastic	Type EB and Type DB
LCP National Plastics, Inc.	Plastic	Type EB and Type DB
	Plastic	Type B and Type C
Northern Pipe Products	Plastic	Type B, C, and D
OMNI	Flexible plastic	HDPE Duct
Petroflex	Flexible plastic	HDPE Duct
	Flexible plastic	Corrugated HDPE Duct
Phillips Products Co., Inc.	Flexible plastic	Driscon 3200
Phone Ducs	Plastic	Multiple plastic conduit (4, 6, & 9 Way)
PLEXCO	Flexible plastic	PLEXCO Duct
PWPipe	Plastic	Type EB and Type DB
Pyramid Industries, Inc.	Plastic	Type EB and Type DM
	Flexible plastic	HDPE Conduit
Quail Plastics	Plastic	Type EB and Type DB
Queen City Plastics	Plastic	Type EB and Type DB
River City Plastics	Plastic	Type EB and Type DB
Sedco	Plastic	Type EB and Type DB
Southern Pipe, Inc.	Plastic	PVC Types EB, DB, and Sch. 40
Tamaqua Cable Products	Flexible plastic	HDPE Duct
Tridyn Industries	Plastic	Type EB and Type DB
Vassallo Industries	Plastic	Type B and Type C
Wesflex	Flexible plastic	Flex-Con

2)

3) or equal

J. Fiberglass Conduit

1. Drawing Reference: Fiberglass
2. Construction:
 - a. Trade Standard Sizes

- b. Meets NEMA TC 14
 - c. Complete system of joints and threaded steel conduit couplers
- 3. Manufacturers:
 - a. TVC Communication/Vikimatic Fiberglass Conduit
 - b. Champion Fiberglass
 - c. FRE Composite
 - d. or equal.

2.4 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS

A. General

- 1. UL 514B.
- 2. Listed in UL Electrical Construction Materials List.

B. Conduit Fittings, Insulated Throat Grounding Bushings

- 1. Description
 - a. Threaded for Rigid Steel Conduit and Intermediate Metal Conduit.
 - b. UL Listed for use with copper conductors.
 - c. Thermoplastic insulated liner for 105 degrees Celsius.
 - d. Body of malleable iron, zinc plated; or die cast zinc.
- 2. Manufacturer
 - a. Thomas & Betts (Steel City) BG-801 Series
 - b. O-Z/Gedney
 - c. or equal.

- C. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.
- D. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.
- E. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.

F. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling shall accommodate .75-inch deflection, expansion, or contraction in any direction, and allow 30-degree angular deflections. Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber jacket and stainless steel jacket clamps. Unit shall comply with UL467 and UL514.

1. Manufacturer:
 - a. OZ/Gedney Type DX
 - b. Steel City Type EDF
 - c. or equal.

G. Fire rated penetration seals:

1. UL classified.
2. Conduit penetrations in fire rated separation shall be sealed with a UL classified assembly consisting of fill, void or cavity materials.
3. The fire rated sealant material shall be the product best suited for each type of penetration, and may be a caulk, putty, composite sheet or wrap/strip.
4. Penetrations of rated floors shall be sealed with an assembly having both F and T ratings at least equal to rating of the floor.
5. Penetrations of rated walls shall be sealed with an assembly having an F rating at least equal to the rating of the wall.

H. Standard products not herein specified:

1. Submit for review a listing of standard electrical conduit hardware and fittings not herein specified prior to use or installation, i.e. locknuts, bushings, etc.
2. Listing shall include manufacturers name, part numbers, and a written description of the item indicating type of material and construction.
3. Miscellaneous components shall be equal in quality, material, and construction to similar items herein specified.

I. Hazardous area fittings: UL listed for the application.

2.5 JUNCTION AND DEVICE BOXES

A. Junction and Device Boxes

1. Drawing References: As shown on Symbol Schedule
2. Construction:
 - a. Concealed/Flush Mounted:
 - b. One or two piece welded knockout boxes. Junction boxes with knockouts are not to be used for surface mounted locations or exposed locations.
 - c. UL 514A, cadmium or zinc-coated 1.25 oz/sq. ft., if ferrous metal.

- d. Pressed sheet steel, for flush indoor locations.
 - e. UL 514C approved if non-metallic.
 - f. At hollow masonry, tile walls and plaster walls, provide with device rings as required.
 - g. Surface mounted:
 - 1) Conform to the Junction and/or PullBox construction scheduled on the Plans. Where construction not otherwise scheduled or noted on the plans, conform to the following.:
 - h) Cast iron with threaded hubs and mounting lugs.
 - i) Gasketed cover with spring lid.
 - 2) Concrete floor embedded:
 - j) Cast iron concrete pour boxes with screwed brass cover, unless otherwise noted.
 - k) Cadmium plated screw cover attachment at least 6" on center.
 - h. If size not otherwise noted, at least 4S (4" square) by 2-1/8" deep, or Code minimum size, whichever is larger.
 - 1) Wherever 4S is indicated, contractor may at their option substitute 4-11/16" or 5" (5S) square boxes while maintaining the minimum depth required by these specifications and the drawings.
 - 2) At recessed masonry wall installations, provide gangable masonry boxes.
 - i. Provide complete with approved type of connectors and required accessories, including attachment lugs or hangers. Provide raised device covers as required to accept scheduled device.
3. Approvals.
- a. UL 514A
4. Manufacturers:
- a. Interior, flush:
 - 1) Steel City.
 - 2) Bowers
 - 3) Randl Industries, Inc. (5S Boxes).
 - 4) or equal.
 - b. Interior, flush 5S Boxes
 - 1) Randl, Inc. 5 Square Telecommunications Boxes
 - 2) or equal.
 - c. Surface mount or exterior, exposed with cover of same construction.
 - 1) Appleton

- 2) Pyle-National
- 3) or equal.
- d. Other conditions:
 - 1) Any meeting approvals and requirements.

2.6 CABINETS AND ENCLOSURES

A. Terminal Cabinets:

- 1. Drawing Reference: As Scheduled.
- 2. All security system enclosures to be equipped with tamper detection. All enclosures should be appropriate to the environment. External enclosures must meet standard to withstand high moisture sea air.
- 3. Construction:
 - a. Interior Applications:
 - 1) Zinc Coated Sheet Steel, code gauge with standard concentric knockouts for conduit terminations.
 - 2) Finish: Manufacturer's standard gray baked enamel finish.
 - 3) Covers: Trim fitted, continuous hinged steel door, flush catch – lockable and keyed to match. Screw fastened doors not acceptable.
 - l) Door face to be not less than 95% of panel interior dimensions.
 - b. Exterior Applications
 - 1) Enclosures to be NEMA 4X Type 316 Stainless Steel or non-metallic
 - c. Interior dimensions not less than those scheduled.
 - d. Provide with 3/4" fire retardant treated ply backboard.
- 4. Mounting:
 - a. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - b. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.
 - c. Interior Applications:
 - 1) NEMA 250 Type 1, unless otherwise noted. Refer to plans and schedules.
 - d. Exterior Applications:
 - 1) NEMA 250 Type - NEMA 4X.
- 5. Manufacturers:
 - a. B-Line Electrical Enclosures
 - b. Circle AW Products.

- c. Hammond
- d. Henessey.
- e. Hoffman.
- f. Myers Electric Products
- g. Rittal.
- h. or equal.

2.7 WIREWAY

A. Lay-In Wireway

- 1. Drawing Reference: Gutter
- 2. Features/Functions/Construction
 - a. NEMA Type 1, unless otherwise noted.
 - b. ANSI 61 Gray polyester powder finish inside and outside.
 - c. Screw fastened cover completely removable to provide complete access to interior.
 - d. 6"x6" cross-section minimum, size for 30% fill maximum
- 3. Approvals
 - a. UL 870
 - b. NEMA Type 1
- 4. Manufacturers
 - a. Hoffman Lay-In Type 1 Wireway
 - b. Square D
 - c. Circle AW
 - d. or equal

2.8 THROUGH PENETRATIONS SEALANT SYSTEMS

- A. At a minimum, follow all manufacturer instructions. In case of discrepancy between manufacturer and contractor requirements, the more stringent shall apply. In the case of conflicting instructions, report any discrepancy to the City's Representative in a timely fashion so as not to impact the construction timeline.
- B. Application: Through Penetration Sealant Assemblies, Renenterable
 - 1. Zero-maintenance firestop assemblies shall be used at all penetrations of rated partitions when the pathway on one or both sides of the wall, ceiling or floor is open, such as J-hooks or cable tray.

2. Communications cable tray or ladder rack shall not be continued through a fire-rated wall. Stop the tray or ladder rack, install multiple zero- maintenance firestop assemblies as needed, and continue the tray or ladder rack on the other side. Ensure grounding of the cable tray is continuous through the wall.
 3. Electronic security system conduit sleeves through a single fire-rated wall shall not be used. For these applications, a zero-maintenance firestop assembly is required.
- C. Application: Firestopping for Conduits and Other Closed Pathways
1. Firestopping is required for all fire-rated penetrations where a electronic security system conduit or other closed pathway penetrates one or more membranes of a fire-rated wall floor or ceiling
 2. Required for all electronic security system outlets located on fire-rated walls. Systems shall be UL CLIV tested
- D. For all penetrations for electronic security system openings through fire-rated walls, floors and ceilings, install the same manufacturer's product for that type of penetration throughout the project.
- E. Coordinate with all other trades prior to installation:
1. To ensure that through penetration firestop systems are installed according to specified requirements.
 2. To ensure that sizing of openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems is appropriate.
- F. All penetrations through fire-rated building structures (walls, ceilings and floors) shall be sealed with an appropriate firestop system that at least matches the fire rating of the structure. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire-rated structure).
1. Any penetrating item i.e., riser slots, cables, conduit, cable tray, and raceways, etc. shall be properly firestopped.
 2. Through penetrations shall be sealed on both sides of the structure.
 3. Electronic security system outlet back-boxes installed in fire-rated walls shall be completely enclosed in an appropriate firestopping assembly within the wall.
 4. Conduit sleeves shall not be used for penetrating fire-rated floors, ceilings and walls. A zero-maintenance firestop assembly shall be used instead.
- G. Verify the locations of all fire-rated walls prior to installation.
- H. Firestopping assemblies must make a gas, smoke and water tight seal when activated in a fire.
- I. Multiple cable bundles planned to penetrate a fire-rated wall and entering the same space within 10 feet of each other shall be consolidated in to a single penetration, unless one or both penetrations are membrane penetrations.
- J. Ambient Conditions:

1. Do not install firestopping products when ambient or substrate temperatures are outside the limitations recommended by the manufacturer.
 2. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.
 3. Maintain the minimum temperature before, during, and for a minimum 3 days after installation of materials.
- K. Schedule installation of firestopping after completion of the penetrating item (e.g., conduit) installation but prior to the covering or concealing of openings.
- L. Before beginning installation:
1. Examine and clean the affected surfaces, as they shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellants, and any other substances that may inhibit optimum adhesion.
 2. Provide masking and temporary covering to protect adjacent surfaces.
 3. Do not proceed until unsatisfactory conditions have been corrected.
- M. After installation:
1. Remove equipment, materials, and debris, leaving area in undamaged, clean condition.
 2. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.
 3. Do not cover installed firestopping assemblies until inspected by the City's Representative.
- N. All firestop systems (including the cabling through them) and identification labels shall be installed prior to the City Representative's above-ceiling inspection.
- O. Labeling
1. At all firestop locations, install a permanent label near the firestop on each side of the wall, ceiling or floor. Labels shall be pre-printed and include:
 - a. Manufacturer of the firestop.
 - b. Name of product and UL System Number.
 - c. Name of installer and company name
 - d. Date of installation.
 - e. Rating of the wall/system (F and T ratings).
 2. One location may have multiple labels (e.g. for a firestop in the annular space around a conduit penetration and a firestop within the conduit around the cables).
 3. Labels shall not be painted over or otherwise obscured or defaced.

2.9 SUPPORTING DEVICES

A. General

1. Supports to be sized to suit load and selected to match mounting conditions

B. Manufacturers

1. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
 - a. Concrete fasteners:
 - 1) Phillips "Red-Head".
 - 2) Remington.
 - 3) Ramset.
 - 4) Hilti
 - 5) Simpson Strong-Tie
 - 6) or equal.
 - b. Concrete inserts and construction channel:
 - 1) Unistrut Corp.
 - 2) GS Metals "Globe Strut."
 - 3) Thomas & Betts "Kindorf" Corp.
 - 4) Or equal.
 - c. Conduit straps:
 - 1) O-Z/Gedney.
 - 2) Erico "Caddy" Fastening Products.
 - 3) Thomas & Betts "Kindorf" Corp.
 - 4) Or equal.
 - d. Beam Clamps
 - 1) Cooper B-Line
 - 2) SuperStrut
 - 3) Unistrut
 - 4) or equal
 - e. Aircraft Cable Sway Braces
 - 1) Mason Industries
 - 2) M.W. Sausse/Vibrex
 - 3) Loos & Company, Inc.
 - 4) or equal.

C. Concrete Fasteners

1. Provide expansion-shield type concrete anchors.
2. Provide powder driven concrete fasteners with washers. Obtain approval by City's Representative prior to use.

D. Concrete Inserts

1. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of ¼ inch to ½ inch diameter thread for rod support.

E. Aircraft cable sway braces

1. Steel rope sized to meet load.

F. Construction Channel:

1. Construction:
 - a. 1-5/8" square galvanized channel formed from U.S.S.G No. 12 or 0.109 inch cold formed steel with 17/32-inch diameter bolt holes, and 1-1/2 inch on center in the base of the channel.
 - b. 10 foot sections.
2. All supporting materials by same manufacturer.

G. Beam Clamps

1. Malleable iron electro-galvanized steel beam clamps selected to match building structural steel members.

H. Conduit Straps

1. One hole strap, steel or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.
 - a. Use malleable strap with spacers for exterior and wet locations.
 - b. Use steel strap without spacers for interior locations.
2. Steel channel conduit strap for support from construction channel.
3. Steel conduit hanger for pendant support with threaded rod
4. Steel wire conduit support strap for support from independent #12 gauge hanger wires.

I. Threaded rods, couplings, screws and nuts:

1. Electrolytically coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.

J. Miscellaneous Parts

1. Hot dipped galvanized after fabrication; after cutting, de-burring and hole drilling. Coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.

K. Exterior/Wet Service Application

1. Electronic security systems hangers or supports in wet areas or areas exposed to outside air including but not limited to building exterior, Tank Farm, AH-1 Mechanical Room, Greenhouse Interior or similar, shall be need to be suitably corrosion resistant, constructed of either 316 stainless steel or non-metallic
2. Manufacturers:
 - a. Cooper Industries
 - b. Champion Fiberglass
 - c. Enduro Composites
 - d. Seasafe
 - e. Or equal.

L. Paint/Tape for Touch-up:

1. Zinc: CRC "Zinc-It", Glyptal, Enterprise Galvanizing "Galambra", or equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. The City's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the City.

3.2 EXAMINATION

- A. Thoroughly examine site conditions for acceptance of supporting device installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.3 PREPARATION

- A. Coordinate size, shape and location of concrete pads required for equipment installation with the work of the other trades
- B. Lay out support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.
- C. Where shown on the Drawings or Specifications, install freestanding Electronic Safety and Security equipment on concrete pads.

3.4 CONDUIT APPLICATION

- A. General: Install the following types of conduits and fittings in the locations listed, unless otherwise noted in the drawings:
 1. Exterior, Exposed:
 - a. Type 316 Stainless Steel. with either watertight EMT or IMC type stainless steel fittings. Provide non-metallic or 316 SS supports.

2. Interior, Exposed, Wet and Damp Locations:
 - a. Type CRSC.
3. Interior, Hazardous Locations
 - a. Type RSC
 - b. Type IMC, where permitted by the CEC.
4. Interior, exposed or concealed, dry locations:
 - a. RSC, if subject to physical abuse.
 - b. EMT, if not subject to physical abuse.
5. Interior, concealed, damp locations, including in masonry walls.
 - a. RSC
6. Embedded in Concrete
 - a. RSC or rigid non-metallic conduit.
 - b. PVC Type Schedule 40.
7. Transition from walls, floor boxes and monuments to open plan furniture systems:
 - a. Liquidtight

3.5 GENERAL REQUIREMENTS

- A. Refer to the manufacturer's instructions and conform thereto.
- B. Distribution Pathway via EMT Raceway:
 1. EMT conduit is to be installed meeting the NEC handbook Article 348 Installation Specifications.
 2. Provide escutcheon plates for all through wall conduit stubs.
 3. All ends of conduits shall be cut square, reamed and fitted with insulated bushing.
 4. All conduit which passes through fire walls shall be sealed with fire stop putty after all station wire has been installed.

3.6 MOUNTING AND INSTALLATION – DEVICE BOXES

- A. Conform to the more restrictive of NEMA OS 3-2002 and the following.
- B. Provide backboxes at all Electronic Safety and Security systems devices. Installation of device plates directly to wall surface without use of a backbox, unless specifically directed on plans, is unacceptable.
- C. The distance between pull boxes shall not exceed 150 feet or more than two 90 degree bends.

- D. Align boxes plumb with floor and surrounding construction. At door frames, locate 4" from frame. Verify placement with City's Representative details to ensure that box clears all trim, etc.
- E. Support and fasten boxes securely. At stud walls use rigid bar hangers, attached to hanger with stud and nut.
- F. At existing locations, provide cutting, patching and finishing as required to maintain or restore finishes so that resulting installation is integrated into the Architectural decor of the particular location.
- G. Mounting Height: the mounting height of a wall-mounted outlet box is defined as the height from the finished floor to the horizontal center line of the cover plate.
- H. Mount outlet boxes with the long axis vertical. Three or more gang boxes shall be mounted with the long axis horizontal.
- I. Install wiring jacks and outlet devices only in boxes which are clean; free from excess building materials, dirt, and debris.
- J. Install wiring jacks and outlet devices after wiring work is complete.

3.7 **TERMINAL CABINETS, JUNCTION BOXES AND PULL BOXES**

- A. General
 - 1. Thoroughly examine site conditions for acceptance of cabinets and enclosures installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.
- B. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- C. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with standards referenced in Section 27 05 29 – Hangers and Supports for Electronic Safety and Security Systems.
- D. "Train" interior wiring, bundle and clamp using specified plastic wire wraps. Separate power and signal wiring.
- E. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- F. Terminate conduit in cabinet with lock nut and grounding bushing.
- G. Cleaning
 - 1. Touch-up paint any marks, blemishes or other finish damage suffered during installation.
 - 2. Vacuum clean cabinet on completion of installation.

3.8 **SUPPORT**

- A. Provide supports for raceways as specified in this Section.
- B. All raceways installed in exposed dry locations shall be grouped in a like arrangement and supported by means of conduit straps, wall brackets or trapeze hangers in accordance with Code and the requirements of this Section. Fasten all hangers from the building structural system.
- C. Provide supports and mounting attachments per the most restrictive of Code and the following
Install no more than one coupling or device between supports.

Raceway Size (inches)	No of cables in run	Location	Support Spacing (feet)	
			RSC	EMT
Horizontal Runs				
½, 3/4	1-2	Flat Ceiling Wall Runs	5	5
½, 3/4	1-2	Where Access Limited To Building Structure	7	7
½, 3/4	3≥	Any Location	7	7
1≥	1-2	Flat Ceiling Or Wall	6	6
1≥	1-2	Where Access Limited To Building Structure	10	10
1≥	3≥	Any Locations	10	10
ANY	ANY	Concealed	10	10
Vertical Runs				
½, 3/4	ANY	Exposed	7	7
1, 1-1/4	ANY	Exposed	8	8
1-1/2≥	ANY	Exposed	10	10

- D. The City's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the City.

3.9 RACEWAY INSTALLATION

- A. Access control and intrusion detection systems shall be installed in entirely in raceway sized for 30% cable fill maximum, including:
1. Rough-in for the field devices as detailed and scheduled on the plans.
 2. Pull cabinets located at regular intervals in the building, sized to accommodate the access control and intrusion detection cabling.
 - a. Size raceway between pull cabinets to accommodate fill of field devices.
 - b. Provide two separate raceway systems
 - 1) one for power cabling, including power for door locks and field devices.
 - 2) one for Access Control and Intrusion Detection System field devices, including card readers, motion detectors, glass break sensors, request-to-exit sensors and similar.
 3. Wireway at backboard of BDF and IDF to terminate the raceway arriving from the pull cabinets and directly from the field devices.
 4. Terminal cabinets at backboard of BD and IDF to enclose the TB15's used to terminate the field wiring installed under the work of this contract.
- B. General

1. Raceway runs are shown schematically – Contractor to provide design and implementation of complete pathway system. Install concealed unless specifically shown otherwise. Supports, pull boxes, junction boxes and similar generally not indicated. Provide where designated in addition to those required by the Contractor's design.
 - a. All raceway in new construction shall be run concealed, unless exposed construction is called for on the plans. Bring to the City Representatives any field conditions requiring exposed electronic security systems pathway and receive direction prior to proceeding.
 - 1) Conduit entries to device backboxes shall be made from the rear or side where concealed by architectural finish materials and shall not be exposed to public view and/or tampering.
 - b. Install exposed conduit and raceway parallel and perpendicular to nearby surfaces or exposed structural members, and follow the surface contours. Level and square conduit and raceway runs.
 - c. Raceway runs shall be mechanically and electrically continuous between all each equipment rack and utility demarcation point, receptacle and/or surface raceway strip, as applies.
 - d. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box, or outlet by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter.
 - e. Conduit connections to enclosures will not interfere with components inside enclosure such as batteries, circuit boards, locking mechanisms etc.
 - f. Conduit to be connected to enclosures via knockouts from factory. Additional penetrations are not permitted.
 - g. Bends

- 1) All bends or elbows shall have a minimum radius as follows:

Conduit Size (Inches)	Min. Radius (Inches)
3/4	8
1	12
1-1/4	18
2	24
2-1/2	24
3	30
3-1/2	30
4	30
5	36
6	42

- 2) Use factory elbows or machine bends for conduit bends 1-1/4" and larger.
- h. Make bends and offsets so the inside diameter is not effectively reduced. Make bends in parallel or banked runs from the same center line so that the bends are parallel.

- i. Install at least one (1) 3/8", 200 pound strength nylon pull cord in all empty raceways.
 - j. Raceways crossing building expansion joints or in straight runs exceeding 100 feet shall be provided with UL listed expansion fittings.
 - k. Install conduit seals and drains to prevent accumulated moisture in conduits from entering Electronic Safety and Security Systems enclosures.
2. Do not install conduit in concrete slabs unless specifically directed by City's Representative. Embedded conduits in concrete slab walls, and columns shall be installed in center third between upper and lower layers of reinforcing steel as directed by the City's Representative. Space conduits 8" on center except at cabinet locations where slab thickness shall be increased as directed by the City's Representative.
3. All conduits to be kept 12" away from steam or hot water lines. Install horizontal conduit and raceway runs below water and steam piping.
4. Conduit dropping down to equipment shall be as straight as possible without any offsets, parallel or perpendicular to walls, ceilings and other building features.
5. Conduit installed on any equipment shall be run symmetrical with the equipment and in such a manner as to:
 - a. not to be exposed to damage;
 - b. not interfere with access to components of the equipment that will interfere with maintenance operation or;
 - c. not to be in a manner that the City deems detrimental to its operation.
6. Whenever an installation such as that listed occurs, the Contractor shall make all necessary changes at no additional cost to the City.
7. All cut ends of conduit, scratches, tool marks, etc. on any metallic raceway installed in the ground or on the exterior of the building shall be treated with two coats of specified Touch Up Paint/Tape.
8. Exposed conduit and metallic surface raceway installed in finished spaces shall be painted to match surrounding surfaces using paint and methods directed by the City's Representative.
9. All raceways stubbing up into equipment or racks shall be sealed. Raceways with conductors shall be plugged with duct-seal. Spare raceways shall be capped. Prevent foreign matter from entering conduit and raceway; use temporary closure protection. Replace conduits containing concrete, varnish or other foreign material.
10. Complete installation of conduit and raceway runs before starting installation of cables/wires within conduit and raceway.
11. Use specified conduit and raceway fittings that are of types compatible with the associated conduit and raceway and suitable for the use and location. Join and terminate conduit and raceway with fittings designed and approved for the purpose of the conduit and raceway system and make up tight.
12. Where chase nipples are used, align the raceway and coupling square to the box and tighten the chase nipple so no threads are exposed.

13. Horizontal conduit or EMT runs, where required and permitted, shall be installed as close to ceiling or ceiling beams as practical.
14. Conduit and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes or radiator branches.
15. Conduit and EMT shall not be run through beams, purlins or columns except where permission is granted by City's Representative in writing.
16. Bond installed metallic raceway in accordance with the requirements of the CEC.

3.10 RACEWAY FOR ACCESS CONTROL AND INTRUSION DETECTION SYSTEMS

- A. Refer to general requirements herein above.
- B. Access control and intrusion detection systems shall be installed in entirely in raceway below ceiling line in pathway size for 30% fill maximum, including:
 1. Rough-in for the field devices as detailed and scheduled on the plans.
 2. Surface mounted device boxes, including those intended to mount card readers, local alarm sounders and cameras, to be penetrated from the rear (through the backing construction assembly) to prevent exposing the device to tampering. Surface mount device boxes should be free of knockouts at the sides of the box exposed to public access/view.
 3. Pull cabinets located at regular intervals in the building, sized to accommodate the access control and intrusion detection cabling. Locate pull cans outside of public view.
 - a. Size raceway between pull cabinets to accommodate fill of field devices.
 - b. Coordinate backbox size to ensure that pathway connections to enclosures shall not interfere with components installed inside enclosure including batteries, circuit boards, locking mechanisms, etc. Undersized enclosures exhibiting interference with installed components to be replaced by the Contractor at no expense to the City.
 - c. Pathway including flexible metal and armored cable shall terminate in the sensor or device enclosure.
 - d. Ends of conduit shall be fitted with insulated bushings. Provide continuous complete non-flexible pathways, from device, including pull boxes for all field devices. Leaving exposed conductors at ends of conduits external to sensors and devices not acceptable except above accessible ceiling line.
 4. Gutter at backboard indicated security electronics termination points sized for 30% fill maximum, to terminate the raceway arriving from the pull cabinets and directly from the field devices pathway systems.
 5. Mounting field devices to the cover of surface mounted junction boxes is unacceptable and will be replaced at no cost to the City.
- C. Steel wireway/gutter and terminal cabinets to be provided at backboards of indicated termination rooms to full enclose the electronic security systems access control and alarm systems wiring, terminal devices, TB15's and terminal blocks used to terminate the field wiring installed under the work of this contract as described elsewhere herein.

3.11 HAZARDOUS LOCATIONS

- A. Use rigid steel conduit only.
- B. Install UL listed sealing fittings that prevent passage of explosive vapors in accordance with the manufacturers written instructions. Locate fittings at suitable, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank coverplate having a finish similar to that of adjacent plates or surfaces.
- C. Install raceway sealing fittings at the following points and elsewhere as indicated:
 - 1. Where conduits enter or leave hazardous locations.

3.12 REUSE OF EXISTING CONDUIT

- A. General
 - 1. Existing conduit is to be used as a pathway only where so shown on the drawings.
 - 2. Prior to beginning work involving the use of an existing conduit, the Contractor shall consult with the City's Representative in order to establish whether or not the conduit contains active service.
 - 3. If no active service exists within the conduit, all cable is to be removed, and work is to proceed.
 - 4. If active service does exist within the conduit and it has been determined that service needs to be disrupted, then work on that conduit shall not proceed until a schedule of service outage has been established by City's Representative. Once given direction to proceed, the Contractor shall within the time period of one (1) working day; remove the old cable, install, terminate and test the new cables, and notify the City's Representative the work using the specific conduit has been completed. The City's Representative shall be responsible for the disconnection and reconnecting of the active service cross-connects within the terminal closet(s).
- B. Conduit preparation procedure:
 - 1. Remove existing wires and cables (if any).
 - 2. Run a mandrel ½" smaller than the inside diameter of the conduit through the conduit receiving new wires and cables.
 - 3. If the specified size mandrel will not pass through the existing conduit, start with a smaller size mandrel and increase mandrel size until the specified sized mandrel will pass.
 - 4. Run a wire brush and clean rag with an outside diameter 1/8" larger than the inside of the conduit through the conduit receiving new wires and cables.
 - 5. Repeat above until conduit is clean and materials detrimental to the wire and cables to be installed no longer exit conduit with the clean rag.

3.13 WIREWAY INSTALLATION

- A. Install complete wireway system at electronic security systems backboards, including track, cover plate, device boxes, inside and outside elbows, splice plates, T's, transitions and extension rings and end caps as required.
- B. Any existing surface raceway and/or exposed cabling along the indicated pathway of the raceway to be installed shall be removed prior to the installation of the new raceway. If the existing cabling contains active service, then Contractor shall consult with the City's Representative as to how best maintain the existing service before proceeding with the work.
- C. Provide and install the proper factory fabricated corners, support clips, end connectors, etc. as required.
- D. Corners and joints are to be cut neatly and finished using connector components of specified system. Where components are not available using specified system, to meet requirements of drawings, provide cleanly mitered joints, EMT and/or surface backboxes specified elsewhere herein.
- E. All installed surface raceway shall be inspected for marks, scratches, gaps between sections or improper fitting of connector parts. All such damage shall be repaired to the City's Representatives satisfaction, or the raceway shall be removed and replaced.
- F. Remove sharp corners and edges prior to installation of cable.
- G. Attachment of raceway to walls, floors, and partitions:
 - 1. Attach raceway to the supporting surface with mechanical fasteners applied to building structure per the most restrictive of manufacturer's directions, Code, or these provisions.
 - 2. All surface raceway shall be installed so that its edges are parallel to the vertical or horizontal edge of the surface on which they are mounted. All surface raceway, found not to be installed in this manner, shall be removed and re-installed correctly.
 - 3. Surface raceway shall be secured at 2'-0" intervals (2 spaced screws for 2" and wider raceways) with wood screws into wooden framing or self drilling wall anchors (ITWBildex "Heavy Duty E-Z Toggle", no known equal) into sheetrock or plastic inserts with pre-assembled drive screw for concrete (ITT-HOLUB "HI-DRIVE" nail anchors, no known equal) Powder (explosive charge) driven anchors are not acceptable. The use of adhesives as the sole means for fastening to any surface is not allowed.
 - 4. Screws used in fastening surface raceway shall be no less than 3/4" in length.
 - 5. The proper support clips, as called for by the manufacturer, for securing surface raceway to walls or floors are to be used per the manufacturer's instructions.

3.14 PENETRATIONS

- A. Gypsum Wall Board Penetrations: Provide circular penetrations maximum 1/8" inch larger than outer diameter of conduit being used. On both sides of the wall fill space between conduit and wall with joint compound, depth to match gypsum board thickness.

- B. As specified elsewhere herein, install UL listed fire-stop system whenever a raceway penetrates a firewall in conformance with the manufacturer's directions, the published systems assembly requirements, CBC Section 709 and 710 and CEC 300-21, whichever is the most restrictive. At cable tray penetrations, provide pillow type removable fire stop per CBC Section 709 and 710, the published systems assembly requirements and the manufacturer's directions, whichever is the most restrictive.
- C. All Electronic Safety and Security systems conduit openings in walls and floors are the responsibility of the Contractor. Install sleeves shown on the drawings when the concrete is poured. Any openings required after the concrete has set maybe core drilled.

3.15 THROUGH PENETRATIONS SEALANT SYSTEMS

- A. At a minimum, follow all manufacturer instructions. In case of discrepancy between manufacturer and contractor requirements, the more stringent shall apply. In the case of conflicting instructions, report any discrepancy to the City's Representative in a timely fashion so as not to impact the construction timeline.
- B. Application: Through Penetration Sealant Assemblies, Renenterable
 - 1. Zero-maintenance firestop assemblies shall be used when the pathway on one or both sides of the wall, ceiling or floor is open, such as J-hooks or cable tray.
 - 2. Communications cable tray or ladder rack shall not be continued through a fire-rated wall. Stop the tray or ladder rack, install multiple zero- maintenance firestop assemblies as needed, and continue the tray or ladder rack on the other side. Ensure grounding of the cable tray is continuous through the wall.
 - 3. Electronic security system conduit sleeves through a single fire-rated wall shall not be used. For these applications, a zero-maintenance firestop assembly is required.
- C. Application: Firestopping for Conduits and Other Closed Pathways
 - 1. Firestopping is required for all fire-rated penetrations where a electronic security system conduit or other closed pathway penetrates one or more membranes of a fire-rated wall floor or ceiling
 - 2. Required for all teleelectronic security system outlets located on fire-rated walls. Systems shall be UL CLIV tested
- D. For all penetrations for electronic security system openings through fire-rated walls, floors and ceilings, install the same manufacturer's product for that type of penetration throughout the project.
- E. Coordinate with all other trades prior to installation:
 - 1. To ensure that through penetration firestop systems are installed according to specified requirements.
 - 2. To ensure that sizing of openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems is appropriate.

- F. All penetrations through fire-rated building structures (walls, ceilings and floors) shall be sealed with an appropriate firestop system that at least matches the fire rating of the structure. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire-rated structure).
 - 1. Any penetrating item i.e., riser slots, cables, conduit, cable tray, and raceways, etc. shall be properly firestopped.
 - 2. Through penetrations shall be sealed on both sides of the structure.
 - 3. Electronic security system outlet back-boxes installed in fire-rated walls shall be completely enclosed in an appropriate firestopping assembly within the wall.
 - 4. Conduit sleeves shall not be used for penetrating fire-rated floors, ceilings and walls. A zero-maintenance firestop assembly shall be used instead.
- G. Verify the locations of all fire-rated walls prior to installation.
- H. Firestopping assemblies must make a gas, smoke and water tight seal when activated in a fire.
- I. Multiple cable bundles planned to penetrate a fire-rated wall and entering the same space within 10 feet of each other shall be consolidated in to a single penetration, unless one or both penetrations are membrane penetrations.
- J. Ambient Conditions:
 - 1. Do not install firestopping products when ambient or substrate temperatures are outside the limitations recommended by the manufacturer.
 - 2. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.
 - 3. Maintain the minimum temperature before, during, and for a minimum 3 days after installation of materials.
- K. Schedule installation of firestopping after completion of the penetrating item (e.g., conduit) installation but prior to the covering or concealing of openings.
- L. Before beginning installation:
 - 1. Examine and clean the affected surfaces, as they shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellants, and any other substances that may inhibit optimum adhesion.
 - 2. Provide masking and temporary covering to protect adjacent surfaces.
 - 3. Do not proceed until unsatisfactory conditions have been corrected.
- M. After installation:
 - 1. Remove equipment, materials, and debris, leaving area in undamaged, clean condition.
 - 2. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

3. Do not cover installed firestopping assemblies until inspected by the City's Representative.
- N. All firestop systems (including the cabling through them) and identification labels shall be installed prior to the City Representative's above-ceiling inspection.
- O. Labeling
 1. At all firestop locations, install a permanent label near the firestop on each side of the wall, ceiling or floor. Labels shall be pre-printed and include:
 - a. Manufacturer of the firestop.
 - b. Name of product and UL System Number.
 - c. Name of installer and company name
 - d. Date of installation.
 - e. Rating of the wall/system (F and T ratings).
 2. One location may have multiple labels (e.g. for a firestop in the annular space around a conduit penetration and a firestop within the conduit around the cables).
 3. Labels shall not be painted over or otherwise obscured or defaced.

3.16 **SUPPORT INSTALLATION**

- A. Furnish and install supporting devices as noted throughout the Electronic Safety and Security Systems work.
- B. Electronic Safety and Security device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.
- C. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using powder actuated tools, precast inserts, expansion anchors, preset inserts or beam clamps.
- D. Use powder actuated tools, self-drilling anchors, expansion anchor, or preset inserts on concrete surfaces.
- E. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- F. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or acoustical ceiling suspension wires.
- G. Do not drill structural steel members unless first approved in writing by the City's Representative.
- H. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- I. Install surface-mounted cabinets with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.

- J. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

3.17 ERECTION OF METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

3.18 WOOD SUPPORTS

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

END OF SECTION

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SECTION 28 15 00

INTERCOM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Intercom Stations
 - 2. Paging Speakers
 - 3. Master Intercom Stations
 - 4. Intercom Server
 - 5. Power Supplies
- B. Related Work Under Other Sections
 - 1. Section 28 05 00 – Common Work Results for Electronic Safety and Security.
 - 2. Section 28 05 28 – Pathways for Electronic Safety and Security
 - 3. Section 28 23 00 - Video Surveillance
 - 4. Section 28 46 19 - PLC Integrated Control

1.3 SYSTEM DESCRIPTION

- 1. A detention grade IP intercom system with adjustable talk and listen modes will be provided. The IP intercom system will be server based, and be networked via TCP/IP communication. Intercom stations must be detention grade use.
- 2. The headend equipment must have DSP for auto adjustment of ambient noise. The audio path connection must automatically and actively perform noise cancellation during a call.
- 3. The master station (gooseneck microphone and speaker) shall be capable of both hands-free duplex mode and simplex mode (using push-to-talk).
- 4. The intercom system shall integrate with the HMI system to indicate queues of incoming calls on touchscreen with ability to select specific incoming calls.
- 5. All cell intercoms will be provided with Audio Threshold Monitoring and alarm at the HMI in Central Control.

1.4 COORDINATION

- A. Coordinate with the Owner for all programmable system functions and features using matrix forms to gather user's inputs. Make all necessary program changes at no additional cost prior to final acceptance.

1.5 EXTRA MATERIALS

- A. Deliver the following spare parts to the Owner:
 - 1. (1) Master Intercom Station
 - 2. (3) Intercom Station

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide equipment and components including, but not limited to, the following without substitution. The Contractor will be responsible for the design and operability of all system components of the final approved system. If any of the below components are no longer in production by the manufacturer, replace with an equivalent or better component. If any of the components cannot be found or are in question, provide and submit for approval a component of equal or better quality.
 - 1. Paging Amplifier - Bogen C100
 - 2. Paging Amplifier Rack mt Kit - Bogen RPK50
 - 3. Paging Speaker - Quam 8C10PAOT/TBLUB
 - 4. Outdoor Loud Paging Speaker (with Backbox/Baffle) - Quam VP-2
 - 5. Paging Zone Expander - Harding PZE-110-1
 - 6. Intercom Digital Controller - Harding DCC-S100-0000-E100-MDIP
 - 7. Intercom Digital Expander - Harding DCE-S100-4040-E1
 - 8. Terminal Boards – Equal by Harding
 - 9. Communication Cables – Equal by Harding
 - 10. MTA Connectors – Equal by Harding
 - 11. Administrative Software – Harding DXL-SOF-ADM
 - 12. Master Intercom Station - Harding TMM-640
 - 13. Intercom Station - Harding ICE 300 (25v/4-wire)
 - 14. AM/FM/CD Player – Equal by Clarion CZ-302
 - 15. PoE Network Switch – Equal by Cisco

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with Section 28 05 00, General Requirements.
- B. Comply with manufacturer's recommendations, procedures and standards for the installation and operation of the equipment.
- C. All microphone and line level audio signals shall be shielded, balanced lines. Matching transformers and pads shall be provided as required to ensure balancing and proper levels. Normal line operating levels shall be 0 dBm.

3.2 ADJUSTMENTS

- A. After installation of the Intercommunication and Public Address Systems, and prior to performance testing, functionally test all system devices and other audio components, and all interfaces to other systems, including control panels. In addition, perform the following adjustments and measurements.
- B. Make all intercom speaker tap and amplifier gain adjustments prior performance testing as follows:
 - 1. Intercom Speaker Tap Adjustments: Select intercom taps for 75 dBA at 4 feet on-axis with power input equal to tap setting (for example, at 1/2-watt input).
 - 2. System Amplifier Gain Adjustments: Adjust intercom amplifier gain controls in both the monitor and talk direction to provide unity gain (to produce the same level in the control room as the person talking at the intercom station, and vice versa) with speaker volume controls at mid-range. Adjust amplifiers for either unity gain, or for feedback stability, if unity gain cannot be achieved.
- C. Once all volume levels have been accepted by the County, permanently mark or identify all adjustment settings on the amplifiers and accessories.

3.3 FIELD QUALITY CONTROL

- A. Performance Measurements: Use a one-third-octave spectrum analyzer and pink-noise generator, or other test equipment pre-approved by the County, to measure system performance. Make the following audio performance measurements for the longest and the shortest intercom runs, and for a minimum of three different intercom stations with the longest and shortest runs:
- B. Signal-to-Noise Ratio: Minimum of 40 dB below standard signal levels from 32 Hz to 16 kHz on an "A" weighing scale.
- C. Signal-to-Crosstalk Ratio: Minimum of 40 dB below standard signal levels when measured on any other intercom or audio line.
- D. Signal-to-Transient Ratio: 30 dB or better, measured as the signal-to-noise during any transient caused by the operations of (a) any piece of equipment associated with that program path, or (b) any other electrical, lighting, ventilation equipment and etc.

- E. Intercom Level Uniformity: Less than +/- 2 dB difference in dBA between any two intercom stations.
- F. Testing: Comply with Section 28 05 00, General Requirements.

3.4 **TRAINING**

- A. Provide training in accordance with Section 28 05 00.

END OF SECTION

SECTION 28 23 00

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED WORK IN OTHER SECTIONS:

- A. Section 27 11 19 - Communications Termination Blocks and Patch Panels
 - 1. Provides the patch panels, if not existing to support the cameras installed under the work of this project.
- B. Section 27 15 00 - Communications Horizontal Cabling
 - 1. Horizontal structured cabling to support the cameras installed under the work of this project.
- C. Section 28 05 00 - Common Work Results for Electronic Safety and Security
 - 1. Submittals required of the work of this section.
 - 2. Miscellaneous parts and execution standards for the work of this Section.
- D. Section 28 05 28
 - 1. Provides raceway and backboxes for the work of this Section.

1.3 SCOPE

- A. Work of Division 28 includes provision of a Unified Security Platform (USP), including video surveillance systems as described in this Section. Work of Section 28 23 00 includes provision of the visual surveillance portion of the USP, including but not limited to:
 - 1. Video Surveillance System.
 - a. 180 and 360 degree view high definition Multiview indoor and outdoor, self-illuminated TCP/IP cameras.
 - b. 90 degree detention grade cameras.
 - 2. Network Video Recorder (NVR) based Video Management System (VMS) with:
 - a. Camera licensing for the quantity of cameras shown on the plans plus 10% spare licensing capacity.
 - 3. POE enabled Ethernet Switches.

1.4 SUBMITTALS

- A. Refer to the requirements of Section 28 05 00 – Common Work Results for Electronic Safety and Security.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Video Surveillance Systems:

1. Technical Performance:
 - a. TCP/IP: System demonstrates full conformance with alarming, video analytics functionality, including motion detection using ONVIF Software (Open Network Video Interface Forum) Protocol.
 - b. IP Cameras: Meet Manufacturers performance specification.
2. Functional Performance:
 - a. Monitor and Display
 - 1) Remote monitoring and reviewing of recorded images by persons using:
 - a) City's Local and Wide Area Network.
 - b) Local Area Network using City furnished network switching, and cabling provided under the work of this Project.
 - 2) Provide images suitable for making identification of persons under lighting conditions resulting from the work of this Project and the prevailing environmental conditions at the Project site.
 - b. Record
 - 1) Record video streams using network video recorder provided under the work of this Project
 - c. Retrieve
 - 1) Retrieve any video stream recorded within the minimum required storage window using search and locate tools and event indices as described elsewhere herein.
3. Uninterrupted Power System: For systems deriving camera power from power supplies installed under the work of this Project, sustain system operation for 2 hours following loss of power.

1.6 COORDINATE

1. Coordinate intended camera locations with the work of the Other Trades and the work of Section 28 05 28 – Pathways for Electronic Safety and Security to ensure field conditions do not result in obscuring the intended camera view(s).
2. Refer to Division 27 specifications to ensure that station cabling required for the work of this section.

1.7 DEFINITIONS

- A. Refer additionally to Section 28 05 00 - Common Work Results for Electronic Safety and Security.
- B. Abbreviations used in this Section
 1. ACS – Access Control System
 2. AES: Advanced Encryption Standard
 3. AGC: Automatic gain control
 4. ALPR – Automated License Plate Recognition
 5. API: Application Programming Interface
 6. Aspect ratio: A ratio of width to height in images
 7. Bit Rate: The number of bits/time unit sent over a network
 8. Bonjour: Enables automatic discovery of computers, devices, and services on IP networks.
 9. CSA – Client Software Application
 10. DGM – Dynamic Graphical Maps
 11. DHCP: Dynamic Host Configuration Protocol
 12. DNS: Domain Name System
 13. DVS – Digital Video Server

14. EIS: Electronic Image Stabilization
15. FPS: Frames per Second
16. FTP: File Transfer Protocol
17. H.264 (Video Compression Format)
18. IEEE 802.1x: Authentication framework for network devices
19. IP: Internet Protocol
20. IR light: Infrared light
21. ISO: International Standards Organization
22. JPEG: Joint Photographic Experts Group (image format)
23. LAN: Local Area Network
24. LED: Light Emitting Diode
25. LPR: License Plate Recognition
26. Lux: A standard unit of illumination measurement
27. MBR: Maximum Bit Rate
28. MPEG: Moving Picture Experts Group
29. Multicast: Communication between a single sender and multiple receivers on a network
30. NTP: Network Time Protocol
31. NTSC: National Television System Committee – a color encoding system based on 60Hz
32. NVR - Network Video Recorder
33. ONVIF: Global standard for the interface of IP-based physical security products
34. PACS: Physical Access Control System
35. PAL: Phase Alternating Line – a color encoding system based on 50Hz
36. PTZ: Pan/Tilt/Zoom
37. PoE: Power over Ethernet (IEEE 802.3af/at) standard for providing power over network cable
38. PPF: Pixels per foot
39. Progressive scan: An image scanning technology which scans the entire picture
40. QoS: Quality of Service
41. RAID: Redundant Array of Independent Disks
42. SDK – Software Development Kit
43. SIP: Session Initiation Protocol
44. SMA – Software Maintenance Agreement
45. SMPTE: Society of Motion Picture and Television Engineers
46. SMTP: Simple Mail Transfer Protocol
47. SNMP: Simple Network Management Protocol
48. SSL: Secure Sockets Layer
49. SSM – Server Software Module
50. SaaS: Software as a Service
51. TCP: Transmission Control Protocol
52. TLS: Transport Layer Security
53. UI: User Interface
54. UPS: Uninterruptible Power Supply
55. UPnP: Universal Plug and Play
56. USP: Unified Security Platform
57. USW: Unified Web Client
58. Unicast: Communication between a single sender and single receiver on a network
59. VBR: Variable Bit Rate
60. VMS: Video Management System
61. WDR: Wide dynamic range

1.8 LABELING AND DOCUMENTATION

- A. Label the finished installation. Label each cable at each end uniquely using a Brady or similar cable labeling system.
- B. Document the camera locations on a floor plan using CAD. Assign each camera a unique ID identical with those applied at the NVR and use this identification on the floor plans. Indicate the head end rack location and the major wiring runs. Provide a single-line diagram of the installed system. Submit PDF copies of the as built drawing documentation. In addition submit electronic copies of the CAD files for the City's use. Submit electronic files on a media type determined by the City.
- C. Prepare and provide a hard copy and an electronic copy of an O&M manual for the completed installation. Hard copy to be provided in a three ring binder. The electronic copy to be submitted on a PDF on a media type determined by the City's Representative.

1.9 TRAINING

- A. Train the City's Representatives in operation of the installed video management system. Provide a least two separate four (4) hour training tracks focused on the training needs of specific stakeholder groups within the City's operation and technical staff and City's Technical/Information Technology Support Staff.
 - 1. Provide eight hours classroom and hands-on training in VMS system functionality, IP communications protocols used, device handshaking and overall signal flow and read/write operations used in recording and retrieval. Review directory tree integration mechanisms and requirements for tree maintenance. Review methods for bare metal recovery of operations. Review VMS manufacturer's approved methods for software upgrades and hardware replacement, including failed disks in the storage array.
 - 2. For each Training session, Document the training provided using a camera and video recorder and provide a copy of the recorded training to the City for future reference and use in training new staff.

1.10 QUALITY ASSURANCE

- A. Test Equipment - provide for the purposes of quality assurance as described in Section 28 05 00 - Common Work Results for Electronic Safety and Security.
 - 1. Network Packet Analyzer: (Fluke, Wireshark)
 - 2. Waveform/Vector Monitor.
 - 3. Portable High Resolution Color Picture Monitor (Marshall Electronics, ToteVision or equal).

PART 2 - PRODUCTS

2.1 VIDEO SURVEILLANCE HEADEND EQUIPMENT

- A. General:
 - a. All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's CCTV system.
 - b. All systems and components shall have been thoroughly tested and proven in production use for at least 60 days prior to the installation of this system.
 - c. All CCTV Headend systems and components shall be provided with the availability of a toll free, 24-hour technical assistance program from the manufacturer, which provides immediate technical assistance to the end user at no charge

B. Network Video Management Software (NVMS)

1. Drawing Reference: VMS, NVR
2. The design and performance requirements for the NVMS software are as follows:
3. The NVMS shall be available as a pre-loaded application in the following Avigilon hardware:
 - a. ACC ES HD Recorder
 - b. Avigilon HD Video Appliance
 - c. Avigilon HD Network Video Recorder
 - d. Avigilon HD Network Video Recorder Workstation
4. The NVMS shall be available as a standalone software application with the following system requirements:
 - a. Windows 10 IoT or LTSB
 - b. Windows Server 2016 and above
5. The NVMS software application can be installed on any open platform hardware, and does not require hardware multiplexer or time-division technology for video or audio.
6. The NVMS shall support increasing recording storage capacity without additional licenses.
7. The NVMS shall decompress H.264 video through the client graphics card / graphical processing unit.
8. The NVMS shall be an enterprise level software solution that shall be scalable from one client, server and camera up to:
 - a. 100 servers per Site.
 - b. 300 cameras per server
 - c. Up to 10 000 cameras per Site
 - d. Indefinite number of concurrent client to Site connections, limited only by the bandwidth capability of the network and server.
9. The NVMS server and client software applications can be installed and run on the same computer or on separate computers.
10. The NVMS shall include but not limited to the following applications:
 - a. Server Software Applications
 - 1) Control Center Server
 - 2) Control Center Admin Tool
 - 3) Control Center Gateway
 - b. Client Software Applications
 - 1) Control Center Client
 - 2) Control Center Web Client
 - 3) Control Center Player
 - 4) Control Center Camera Installation Tool
 - 5) Control Center Mobile
 - 6) Gateway Web Client (HTML5)
11. The NVMS shall secure video and audio data by securely transmitting all command and control data via TCP/IP using cryptographic keys based on SSL to prevent eavesdropping or tampering.
12. The NVMS shall support storage and processing of video and audio.
 - a. Audio and video must be recorded natively from the camera with no transcoding.
 - b. Audio and video must be synchronized regardless of frame-rate, resolution or bitrate.
13. The NVMS shall support industry standard video compression formats, including but not limited to:
 - a. JPEG2000
 - b. MJPEG
 - c. MPEG-4
 - d. H.264

- e. H.265
- 14. The NVMS shall perform dynamic video stream management.
 - a. Dynamic video stream management shall reduce the system bandwidth and storage usage by only transmitting video to the client as required.
 - b. The client shall communicate the maximum monitor resolution to the server and the server shall act as a video proxy and stream the required video resolution.
 - c. The NVMS shall tile multi-megapixel videos streams and only transmit the requested portion of the video stream to the client.
 - d. Recorded video storage is extended by dynamically reducing the quality of the recorded video over time so that video is still viable but uses less storage.
 - 1) JPEG and JPEG2000 video image rate is reduced to one half or one quarter of the original image rate.
 - 2) H.264 & H.265 video records a high quality stream and a low quality stream. The high quality stream is discarded after a set amount of time.
 - e. Shall be available for local users, remote users and mobile devices.
- 15. The NVMS shall find devices and systems on the network by the following methods:
 - a. Automatic — servers, video and audio sources that are connected to the same network as the client are automatically discovered.
 - b. Search — servers, video and audio sources running on a different network segment than the client can be discovered by searching for the device's IP address or hostname.
 - c. Parent to child — logging into a parent site automatically discovers the configured children sites.
- 16. The NVMS shall allow manually discovered server instances, video and audio sources to be visible to all users of a single client workstation.
 - a. Network settings for all server instances will be identical for all users of a single client workstation.
- 17. The NVMS shall support recording and management of video and audio sources through the use of industry standard drivers. These drivers shall include:
 - a. ONVIF Profile S
 - b. Publically Published API
- 18. The NVMS shall support monitoring video and audio sources from:
 - a. Avigilon **H5/H6 cameras**
 - b. Avigilon self-learning analytics cameras
 - c. Avigilon IP H.264/JPEG2000 cameras and encoders
 - d. Rialto video analytics appliances
 - e. ACTi cameras/encoders
 - f. Arecont cameras
 - g. Axis cameras/encoders
 - h. Bosch cameras/encoders
 - i. IQInvision cameras
 - j. Mobotix cameras
 - k. ONVIF 1.00, 1.01, and 1.02 cameras
 - l. Panasonic cameras/encoders
 - m. Pelco cameras
 - n. Samsung cameras/encoders
 - o. Samsung Techwin cameras
 - p. Sanyo cameras
 - q. Scallop cameras
 - r. Sightlogix cameras
 - s. Sony cameras
 - t. VideoIQ cameras/encoders
- 19. The NVMS shall support de-warping of live and recorded video.

- a. From supported cameras fitted with an Immervision Panomorph lens.
- b. From cameras with a fixed fisheye lens, including but not limited to:
 - 1) Oncam Grandeye Evolution line of cameras.
- 20. The NVMS shall provide the ability to configure and manage alarms and events.
 - a. Individual alarms from a third party system (access control, etc.) can be pre-selected and configured to be monitored.
 - b. Can define alarm and event triggers.
 - c. Can configure resulting video operations.
 - d. Detect if the video or audio signal is lost and alert the system administrator.
 - e. Support receiving Simple Network Management Protocol (SNMP) messages from servers and alert users.
 - f. Alarm and event notifications can be customized and forwarded to:
 - 1) Users logged into the client application
 - 2) Users logged into the mobile application
 - 3) Configured email addresses
 - 4) External entities and third party software, such as central monitoring stations and call centers
 - g. Can escalate alarms from one user or group to another if the alarm is unacknowledged for a preset duration.
 - h. Email notifications can be configured to:
 - 1) Notify users and system administrators when an event or system health error occurs.
 - 2) Schedule when email notifications are sent.
 - 3) Include camera images in email notifications.
 - i. Support receiving digital input triggers and triggering digital outputs from:
 - 1) An input/output board
 - 2) Supported IP camera or encoder
 - 3) Integrated system
- 21. The NVMS shall provide the ability to send central monitoring stations heartbeat messages, or regular notification to confirm the system connection and that there are no events of note.
- 22. The NVMS shall maintain an event log and allow users to use the log events as triggers for specific event actions.
- 23. Video Management Data Storage Server
 - a. EIA 19" Rack Mount chassis, including all necessary mounting rails and hardware to mount in DIN (square hole) 4 post racks as provided under the work of Section 27 11 16 – Communications Cabinets, Racks, Frames and Enclosures.
 - b. Each server not less than 2RU high.
 - c. Quantity of servers: As required and recommended by the VMS manufacturer for the quantity equal to 1.1 times the number of cameras provided under the work of this Project.
 - d. Features/Functions/Performance - iSCSI Raid Arrays
 - 1) Total Capacity: As required to capture full-motion video of specified cameras stored without overwriting for at least 365 days continuous operation. **If Data Aging will be employed, use at least 90 days of full resolution of the camera.**
Assuming:
 - a) 1.1 times the camera count initially provided with the Project. Contractor to calculate the required storage based on the requirements herein below then multiply the result times 1.1 to identify the minimum storage requirement.
 - b) Recording resolution to match resolution of supplied cameras.
 - c) 10 frame per second motion recording minimum

- 2) Minimum RAID Architecture:
 - a) As required by the VMS Manufacturer, but in no case less than RAID 5.
- 3) Minimum Construction and Performance
 - a) As required by the VMS Manufacturer.
- e. Rack mountable, EIA 19", including all necessary mounting rails and hardware to mount in square hole) 4 post racks with DIN (square) openings
- 24. Manufacturer, NVMS/NVR:
 - a. Latest version of Avigilon Unity 8
 - 1) Two (2) Network Video Recorders (Primary & Secondary) to meet the storage requirements, e.g. NVR6-PRM-PLUS-FORM-H-440TB-S22
 - 2) Two (2) Workstations with two (2) 32" touch screen monitors RM7-WKS-2MN
- C. Rack Mount Monitor, Keyboard and 19" Display Console
 - 1. Drawing Reference: CONSOLE KVMS
 - 2. Minimum Features, Functions, Performance, Construction
 - a. Combines an 8-port KVM switch, 19" LCD screen, full keyboard and touchpad in a 1U rack-mountable drawer assembly.
 - b. Mounts into 19"-wide rack, 26"-38" deep.
 - c. Control up to 8 servers from a single, easily accessible console.
 - d. Includes eight cables that support computers with either PS/2 or USB connections
 - e. Flip-up/fold-down screen keeps the console from blocking access to rack equipment when not in use:
 - f. 19" monitor supports video resolutions up to 1280 x 1024
 - g. DDC emulation allows optimal output to the LCD
 - h. Multi-Level Password Security
 - i. Enhances security by limiting access to an administrator and up to 4 local users
 - j. Two-level log-out allows for manual log-out or automatic log-out after a user-defined period of time has passed.
 - 3. Manufacturers:
 - a. Tripp Lite NetDirector 8-Port Console KVM Switch B020-U08-19-IP
 - b. APC
 - c. Or equal.

2.2 CAMERAS AND RELATED

- A. IP Surveillance Indoor Dome Camera, Fixed, Corner Camera:
 - 1. Drawing References:
 - a. Interior Cameras, Circle with 1 in center and one arrowhead, subscript D
 - 2. Minimum Features, Functions, Performance, Construction
 - a. Housing: Provide stainless steel enclosure with environmental rating sufficient to withstand high pressure washing.
 - b. Performance:
 - 1) Image Sensor: 1/2.8 inch progressive scan CMOS.
 - 2) Maximum Resolution:
 - a) Aspect Ratio: 16:9: 2560 x 1440.
 - b) Aspect Ratio: 4:3: 2592 x 1944.
 - c. Imaging Rate:
 - 1) WDR Off: (50 Hz/60 Hz): 25 fps/30 fps.
 - 2) WDR On: (50 Hz/60 Hz): 20 fps/20 fps.
 - d. Dynamic Range:
 - 1) WDR Off: 83 dB.

- 2) WDR On: 126 dB.
- e. Minimum Illumination:
 - 1) Color: 0.027 lux.
 - 2) Monochrome: 0.014 lux.
 - 3) IR: 0.0 lux.
- f. Field of View:
 - 1) Horizontal angle: 16:9: 133 degrees.
 - 2) Horizontal angle: 4:3: 135 degrees.
 - 3) Vertical angle: 16:9: 74 degrees.
 - 4) Vertical angle: 4:3: 95 degrees.
- 3. Manufacturer:
 - a. Avigilon 5.0C-H5A-CR2-IR-SS
- B. IP Surveillance Interior/Exterior Dome Camera, Three Camera Sensors minimum, Fixed, 180° Combined Horizontal Angle:
 - 1. Drawing References:
 - a. Interior Cameras, Circle with 3 in center and three arrowheads, subscript CI
 - b. Exterior Cameras, Circle with 3 in center and three arrowheads, subscript CE
 - 2. Minimum Features, Functions, Performance, Construction
 - 1) Image Sensor 1/2.5" progressive scan CMOS
 - 2) Aspect Ratio 16:9
 - 3) Active Pixels 3840 x 2160
 - 4) 3x Image Sensor Max Resolution (per image sensor) 11520 x 2160
 - 5) Minimum Illumination
 - a) 0.02 lux (F1.8) in color mode
 - b) 0.04 lux (F1.8) in monochrome mode
 - c) 0 lux with optional IR illuminator
 - 6) Image Rate-High Frame rate Mode:
 - a) 3x Image Sensor (60Hz, 50Hz) 15/14fps
 - 7) Dynamic Range 100dB, true WDR, dual exposure
 - b. Image Compression Method
 - 1) H.264 HDSM Smart Codec
 - 2) H.265 HDSM Smart Codec
 - 3) Motion JPEG
 - c. Streaming
 - 1) Multi-stream H.264
 - 2) Multi-stream H.265
 - 3) Motion JPEG
 - d. Motion Detection Selectable sensitivity and threshold
 - e. Electronic Shutter Control
 - 1) Automatic
 - 2) Manual (1/8 to 1/8000sec)
 - f. Iris Control Fixed
 - g. Day/Night Control
 - 1) Automatic
 - 2) Manual
 - h. Lens (Per Image Sensor)
 - 1) 4mm F1.8-101°
 - 2) 5.2mm F1.8-70°

- 3) Remote Focus
- i. Image Control
 - 1) Image Compression Method H.264 (MPEG-4 Part 10/AVC), Motion JPEG
 - 2) Streaming Multi-stream H.264 and Motion JPEG
 - 3) Motion Detection Selectable sensitivity and threshold
 - 4) Electronic Shutter Control Automatic, Manual (1/6 to 1/8000 sec)
 - 5) Iris Control Automatic, Manual
 - 6) Day/Night Control Automatic, Manual
 - 7) Flicker Control 50 Hz, 60 Hz
 - 8) White Balance Automatic, Manual
 - 9) Backlight Compensation Adjustable
 - 10) Privacy Zones Up to 64 zones
 - 11) Audio Compression Method G.711 PCM 8 kHz
 - 12) Audio Input/Output Line level input and output
 - 13) External I/O Terminals Alarm In, Alarm Out
- j. Network
 - 1) Network 100BASE-TX
 - 2) Cabling Type CAT5
 - 3) Connector RJ-45
 - 4) API ONVIF compliance version 1.02, 2.00, Profile S (www.onvif.org)
 - 5) Security Password protection, HTTPS encryption, digest authentication, WS authentication, user access log, 802.1x port based authentication
 - 6) Protocol IPv4, HTTP, HTTPS, SOAP, DNS, NTP, RTSP, RTCP, RTP, TCP,UDP, IGMP, ICMP, DHCP, Zeroconf, ARP,
 - 7) Streaming Protocols RTP/UDP, RTP/UDP multicast, RTP/RTSP/TCP, RTP/RTSP/HTTP/TCP, RTP/RTSP/HTTPS/TCP, HTTP
- k. Mounting hardware: Contractor to select to suit application, with manufacturer accessory mounting plates, pipe mounts, pendant adapters, parapet mounts, corner mounts and backboxes as necessary to mount to rough-in conditions.
- 3. Manufacturers:
 - a. Avigilon
 - 1) 3 Imager:
 - a) 24C-H5A-3MH [3 x 4K (8MP)]
 - b) Clear cover
 - c) Select In-ceiling mount, surface mount or pendant mount to suit mounting conditions.
- C. IP Surveillance Interior/Exterior Dome Camera, Four Camera Sensors, Fixed, 360° Combined Horizontal Angle:
 - 1. Drawing References:
 - a. Interior Cameras, Circle with 4 in center and four arrowheads, subscript CI
 - b. Exterior Cameras, Circle with 4 in center and four arrowheads, subscript CE
 - 2. Minimum Features, Functions, Performance, Construction
 - 1) Image Sensor 1/2.5" progressive scan CMOS
 - 2) Aspect Ratio 16:9
 - 3) Active Pixels 3840 x 2160
 - 4) 4x Image Sensor Max Resolution (per image sensor) 15360 x 2160
 - 5) Minimum Illumination

- a) 0.02 lux (F1.8) in color mode
- b) 0.04 lux (F1.8) in monochrome mode
- c) 0 lux with optional IR illuminator
- 6) Image Rate-High Frame rate Mode:
 - a) 4x Image Sensor (60Hz, 50Hz) 10/10fps
- 7) Dynamic Range 100dB, true WDR, dual exposure
- b. Image Compression Method
 - 1) H.264 HDSM Smart Codec
 - 2) H.265 HDSM Smart Codec
 - 3) Motion JPEG
- c. Streaming
 - 1) Multi-stream H.264
 - 2) Multi-stream H.265
 - 3) Motion JPEG
- d. Motion Detection Selectable sensitivity and threshold
- e. Electronic Shutter Control
 - 1) Automatic
 - 2) Manual (1/8 to 1/8000sec)
- f. Iris Control Fixed
- g. Day/Night Control
 - 1) Automatic
 - 2) Manual
- h. Lens (Per Image Sensor)
 - 1) 4mm F1.8-101°
 - 2) 5.2mm F1.8-70°
 - 3) Remote Focus
- i. Image Control
 - 1) Image Compression Method H.264 (MPEG-4 Part 10/AVC), Motion JPEG
 - 2) Streaming Multi-stream H.264 and Motion JPEG
 - 3) Motion Detection Selectable sensitivity and threshold
 - 4) Electronic Shutter Control Automatic, Manual (1/6 to 1/8000 sec)
 - 5) Iris Control Automatic, Manual
 - 6) Day/Night Control Automatic, Manual
 - 7) Flicker Control 50 Hz, 60 Hz
 - 8) White Balance Automatic, Manual
 - 9) Backlight Compensation Adjustable
 - 10) Privacy Zones Up to 64 zones
 - 11) Audio Compression Method G.711 PCM 8 kHz
 - 12) Audio Input/Output Line level input and output
 - 13) External I/O Terminals Alarm In, Alarm Out
- j. Network
 - 1) Network 100BASE-TX
 - 2) Cabling Type CAT5
 - 3) Connector RJ-45
 - 4) API ONVIF compliance version 1.02, 2.00, Profile S (www.onvif.org)
 - 5) Security Password protection, HTTPS encryption, digest authentication, WS authentication, user access log, 802.1x port based authentication

- 6) Protocol IPv4, HTTP, HTTPS, SOAP, DNS, NTP, RTSP, RTCP, RTP, TCP,UDP, IGMP, ICMP, DHCP, Zeroconf, ARP,
- 7) Streaming Protocols RTP/UDP, RTP/UDP multicast, RTP/RTSP/TCP, RTP/RTSP/HTTP/TCP, RTP/RTSP/HTTPS/TCP, HTTP
- k. Mounting hardware: Contractor to select to suit application, with manufacturer accessory mounting plates, pipe mounts, pendant adapters, parapet mounts, corner mounts and backboxes as necessary to mount to rough-in conditions.
- 3. Manufacturers:
 - a. Avigilon
 - 1) 4 Imager:
 - a) 32C-H5A-4MH [4 x 4K (8MP)]
 - b) Clear cover
 - c) Select In-ceiling mount, surface mount or pendant mount to suit mounting conditions.

2.3 POWER SUPPLIES

- A. Computer Grade Uninterruptible Power System, UL Listed
 - 1. Drawing Reference: 5 KVA UPS + (2) BATTERY PACKS
 - 2. Features/Functions/Performance:
 - a. Provide continuous, no-break power with sine wave output.
 - b. Size to carry connected load.
 - c. Provide Transient Over-Voltage (TOV) Surge Suppression; comply with ANSI/IEEE C62.41-1980, Category A and Category B.
 - d. Provide complete isolation from Line.
 - e. Provide output voltage regulation to ANSI C84.1 for computing equipment.
 - f. SNMP manageable and status reporting to City's Management console. Provide Ethernet network interface on UPS.
 - g. Provide output KVA, switch-mode power supply rated, not less than 150% of connected load indicated.
 - h. Rack Mounted - at full height racks, provide rack mounted equipment.
 - 3. Acceptable:
 - a. APC Smart-UPS SRT 5000VA RM 208V, model number: SRT5KRMXLTUS with two (2) APC Smart-UPS SRT 192V, 3RU Battery Pack, model number: SRT192RMBP

2.4 VIDEO TERMINAL EQUIPMENT

- A. LCD TV, 65 in. Diagonal
 - 1. Drawing Reference: None
 - a. Commercial grade 24/7 duty cycle
 - b. Network (RJ45) Port
 - c. RS232/IP/Serial means of control
 - d. 330 Nit
 - e. 1300:1 Contrast Ratio
 - f. 3840x2160 Max. Resolution
 - g. HDMI In x 3
 - h. Support for SmartThings Apps
 - 2. Features/Functions:
 - 3. Manufacturer:
 - a. Samsung TU690T UHD Smart TV.

- b. Or equal
- B. Flat-Panel Display Wall Mount
 - 1. Drawing Reference: None
 - 2. Functions:
 - a. Can support the required LCD and Plasma Panels supplied by the work of this Project.
 - b. Holds rear of panel away from wall ~2 in. to permit A/V interface mounting behind display.
 - c. Permits display to be tilted in the vertical plane for optimum viewing as directed by the City's Representative.
 - d. Allows the complete mount and display assembly to not protrude more than 4 in. out from wall surface.
 - e. Designed to mount to 16 in., 20 in., 24 in. center stud systems
 - f. Panel can be securely fastened to mount using to prevent theft by adding a City furnished padlock.
 - g. Where mounting fasteners are exposed during normal operations, secure mount with tamper-resistant fasteners.
 - h. Designed to accommodate panels from at least Pioneer, Panasonic, Sharp, Samsung, & LG Electronics
 - i. Heavy duty construction with steel components
 - j. UL or ETL listed
 - k. California OSHPD OPA (seismic restraint pre-approval). Installation to be accordance with OPA.
 - 3. Manufacturers:
 - a. Chief PDRUB Large Flat Panel Swing Arm Wall Mount, 37" Extension
 - b. Or approved equal.

2.5 POE NETWORK SWITCH

- 1. Port Count:
 - a. 24 or 48
- 2. Construction:
 - a. 1 Rack Unit
 - b. Provide accessories as required to rack mount.
- 3. Manufacturers:
 - a. Cisco Catalyst 9300 Series
 - b. Hewlett Packard
 - c. Or equal



Addendum 4

2.6 WORKSTATION FURNITURE

A. Components

- 1. **Frame: Steel**
- 2. **Base: Open stationary**
- 3. **Work Surface**
 - a. **Type: Single**
 - b. **Construction: 1-1/4 inch Solid Surface with bullnose edge.**
 - c. **Faces: Laminate**
 - d. **Edge type: Comfort Edge, 1-1/8 inch molded urethane shaped edge**
 - e. **Laminate face color: Black**
 - f. **Solid surface color. Black**
- 4. **Manufacturers:**

- a. **Winsted Vue-L 99” Stationary Open Base**
- b. **Or equal**

PART 3 - EXECUTION

3.1 PROGRAMMING AND INSTALLATION

A. Initial Systems Programming

1. Meet with City's Representative to establish functional requirements for surveillance systems, including but not limited to the following:
 - a. Camera Views
 - 1) Define in conjunction with the City's representatives the minimum field of view to be provided at each fixed cameras. Contractor to review the target for each camera at the Initial Systems Programming Meeting with the City's Representative and adjust the target view areas, and where required, the mounting location to provide the view currently required by the City's Representative. Where the mounting location requires adjustment, Contractor to coordinate related changes required with City's Representative.
2. Document and submit in accordance with the requirements of Section 28 05 00.
3. Provide initial systems programming in accordance with the preceding.

B. Installation

1. General
 - a. Conform to the manufacturer's recommendations and instructions regarding:
 - 1) camera mounting and adjustment.
 - 2) power and video cable sizing for length of indicated run.
2. Camera Installation
 - a. Locate the cameras in accordance with the plans and as required to provide the target images noted on the plans, except where modified through the pre-construction meeting described above.
 - b. Do not place cameras where they will be subject to ready access or tampering from persons in public access areas of the sites.
 - 1) Bring to the City's Representative attention through an RFI any proposed location that does not require a ladder or similar means of access from the public space.
 - 2) Obtain City's Representative's resolution of the RFI prior to proceeding with the installation.
 - c. Secure cameras to structure so that they cannot be readily removed, including with use tools or by force.
 - 1) Cameras are to be mounted to flush mounted backboxes at fed through rear of camera body, except where surface mounting is explicitly called for.
 - 2) Where surface mounting is indicated, use knock-outs on side of camera housing to connect to conduit. Install backbox containing required structured cabling biscuit box at remote location hidden from view and secure cover with tamperproof fasteners.
 - 3) Select fastening means appropriate to the mounting surface and its underlying framing system and fasten securely to the structure and not to lightweight surface materials. Removal of cameras following successful fastening shall require use of tamper fastener tooling or application of destructive force. City's Representative

reserves the right to request remounting of any camera not found to meet this standard at no additional cost.

- d. Where mounting to pipe mount indicated/or required by field conditions, select materials to maintain stability of camera image under environmental conditions associated with installation location, including wind load and potential for impact.
- e. At exterior cameras, seal openings as directed by the manufacturer's instructions.
- f. Apply manufacturer's recommended anti-graffiti coating to camera housings and domes.
- g. Provide cameras with lensing as required to cover area of coverage indicated on the plans.
- h. Adjust auto-iris systems at night to gain maximum depth of field under low light conditions.
- i. Using a precision display portable video monitor and/or laptop, adjust each camera's angle and field of view as directed by the City's Representative.

3.2 SYSTEM STARTUP

- A. The Contractor shall not apply power to the CCTV system until the following items have been completed:
 1. CCTV system equipment items and NVR interface have been set up in accordance with manufacturer's instructions.
 2. A visual inspection of the CCTV system has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
 3. System wiring has been tested and verified as correctly connected as indicated.
 4. All system grounding and transient protection systems have been verified as properly installed and connected as indicated.
 5. Power supplies to be connected to the CCTV system have been verified as the correct voltage, phasing, and frequency as indicated.
- B. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installation, defective equipment items, or collateral damage as a result of Contractor work/equipment.

3.3 SYSTEMS PERFORMANCE TESTING AND ADJUSTING PROCEDURES

- A. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform all site testing. The City's Representative will witness all performance verification and endurance testing. Written permission shall be obtained from the City's Representative before proceeding with the next phase of testing. Original copies of all data produced during performance verification and endurance testing shall be turned over to the City's Representative at the conclusion of each phase of testing prior to City's Representative approval of the test.
- B. Contractor's Field Testing.
 1. The Contractor shall calibrate and test all equipment, verify system operation, place the integrated system in service, and test the integrated system. Ground rods installed by the Contractor shall be tested as specified in IEEE Std 142. The Contractor shall deliver a report describing results of functional tests, diagnostics, and calibrations including written certification to the City's Representative that the installed complete system has been calibrated, tested, and is ready to begin performance verification testing. The report shall also include a copy of the approved performance verification test procedure. In addition, the Contractor shall make a master video tape recording to DVD showing typical day and

night views of each camera in the system and shall deliver the DVD with the report. Note any objects in the field of view that might produce highlights that could cause camera blinding. Note any objects in the field of view or anomalies in the terrain which may cause blind spots. Note if a camera cannot be aimed to cover the zone and exclude the rising or setting sun from the picture. Note night assessment capabilities and whether lights or vehicle headlights cause blooming or picture degradation. If any of the above conditions or other conditions exist that cause picture degradation or interfere with the camera field of view, the Contractor shall inform the City's Representative. The DVD shall be recorded using the video recorder installed as part of the CCTV system. If a recorder is not part of the CCTV system, the DVD prepared using the Video Management System installed under the work of this Section. The Contractor shall provide the City's Representative with the original tape as part of the documentation of the system and shall submit a letter certifying that the CCTV system is ready for performance verification testing. The field testing shall as a minimum include:

- a. Verification that the video transmission system and any signal or control cabling have been installed, tested, and approved as specified.
 - b. When the system includes remote control/monitoring stations or remote switch panels, verification that the remote devices are functional, communicate with the security center, and perform all functions as specified.
 - c. Verification that all cameras are aimed and focused properly. The Contractor shall conduct a walk test of the area covered by each camera to verify the field of view.
 - d. Verification that cameras facing the direction of rising or setting sun are aimed sufficiently below the horizon so that the camera does not view the sun directly.
 - e. When dome camera mounts are used in the system, verify that all preset positions are correct and that the dome also operates correctly in a manual control mode.
2. The Contractor shall deliver a report describing results of functional tests, diagnostics, and calibrations including written certification to the City's Representative that the installed complete system has been calibrated, tested, and is ready to begin performance verification testing. The report shall also include a copy of the approved performance verification test procedure.

C. Performance Verification Test

1. The Contractor shall demonstrate that the completed CCTV system complies with the contract requirements. Using approved test procedures, all physical and functional requirements of the project shall be demonstrated and shown. The performance verification test, as specified, shall not be started until receipt by the Contractor of written permission from the City's Representative, based on the Contractor's written report. This shall include certification of successful completion of Contractor Field Testing as specified in paragraph "Contractor's Field Testing," and upon successful completion of training as specified. If the CCTV system is being installed in conjunction with an ESS, the CCTV performance verification test shall be run simultaneously with the ESS performance verification test. The City's Representative may terminate testing at any time when the system fails to perform as specified. Upon successful completion of the performance verification test, the Contractor shall deliver test reports and other documentation as specified to the City's Representative prior to commencing the endurance test.
2. Testing
 - a. Picture Monitors:
 - 1) Using indicated video test source, verify linearity and adjust as required.
 - b. Camera Operation: Demonstrate that each camera:
 - 1) Produces images in conformance with specifications and as defined in the initial systems programming requirements.
 - 2) Includes date/time/camera number identification.

- c. Uninterrupted Power Systems: Disconnect normal power service. Demonstrate that the system remains in full operation for the specified time.

3.4 LABELING

- A. Conform with the requirements of Section 27 05 53 – Identification for Communications Systems and for field devices, use the device label assigned per the requirements of Section 28 05 00 - Common Work Results for Electronic Safety and Security.

3.5 VIDEO INTERCOM SYSTEM

- A. Installation
 - 1. Install hands-free color video intercom system in accordance with manufacturer's instructions at locations indicated on the Drawings.
 - 2. Mount equipment plumb, level, square, and secure.
- B. Adjusting
 - 1. Adjust hands-free color video intercom system for proper operation in accordance with manufacturer's instructions.
- C. Demonstration And Training
 - 1. Demonstration:
 - a. Demonstrate that hands-free color video intercom system functions properly.
 - b. Perform demonstration at final system inspection by qualified representative of manufacturer.
 - 2. Instruction and Training:
 - a. Provide instruction and training of City 's personnel as required for operation of hands-free color video intercom system.
 - b. Provide hands-on demonstration of operation of system components and complete system, including user-level program changes and functions.
 - c. Provide instruction and training by qualified representative of manufacturer.

3.6 WARRANTY

- A. The product shall perform in all material respects in accordance with the accompanying user manual, and the media on which the Software Product resides will be free from defects in materials and workmanship under normal use.

3.7 OPTIONAL PREVENTATIVE MAINTENANCE SERVICE CONTRACT

- A. The Contractor shall provide optional pricing for a planned preventative maintenance service contract covering 3 (three) years from end of system warranty (years two through four).
- B. The Contractor's proposal shall clearly define all Security Contractor and manufacturer costs expected over the life of the Preventative Maintenance Service Contract
- C. The City reserves the first to exercise the option for the Preventative Maintenance Service Contract at any time up to the end of the initial systems warranty (end of year one operations).

END OF SECTION

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SECTION 28 46 13

INTEGRATED SEQUENCES OF OPERATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Software Development.
 - 2. Control Electronic System Software
 - 3. Sequences of Operation
- B. Related Work Under Other Sections
 - 1. Section 28 05 00 – Common Work Results for Electronic Safety and Security.
 - 2. Section 28 05 28 – Pathways for Electronic Safety and Security
 - 3. Section 28 15 00 - Intercom System
 - 4. Section 28 23 00 - Video Surveillance
 - 5. Section 28 46 19 - PLC Integrated Control

1.3 DEFINITIONS

- A. Control System Software: A software application program that performs logic and control functions based on programmable criteria.
- B. Programming Workstation: Graphic icon display that allows the operator to monitor system activity and alarm conditions on a real-time basis, and presents the operator with a selection of functions. Typically this portion of the screen/graphics is displayed in all operating modes allowing alarms to be monitored while using other system features.
- C. Icon: Pictorial graphic display of a symbol or devices such as doors, locks, buttons
- D. Operator Interface (OI): Used to generally define computer monitor, mouse, audio, button, or any other devices used for Human-Machine Interfacing.

1.4 **SYSTEM DESCRIPTION**

- A. Provide software development and programming for workstations, control panels, and each system as defined in each respective Section and described in this Section. Sample sequences of operations have been established to provide a base understanding of the project requirements.
- B. Provide separate screens that are graphical based (using customized building/site maps) to indicate respective controlled areas for each control station. Sample screen layouts are provided in the Drawings to indicate the level of complexity and minimum functions.

1.5 **SUBMITTALS**

- A. Comply with Section 28 05 00.
- B. Theory of Operation: Develop and submit functional narratives supported by full-size, color state diagrams for the various combinations of icons and buttons in each operational state. Submit 14 calendar days prior to Review Meeting.
- C. Review Workshop: Attend a review workshop to receive Owner comments on the theory of operation and preliminary development submittal.
- D. Full Development: Incorporate all Owner review comments and resubmit the theory of operation submittal along with full-size, graphic layouts panel. Submit 14 calendar days prior to Owner Workshop and Demonstration.
- E. Control Electronics Software: Develop and submit control electronics software (logic) for each typical function. Submit 14 calendar days prior to Owner Workshop and Demonstration.
- F. Owner Workshop and Demonstration: Attend submittal review meeting along with a complete HMI training/demonstration. After demonstrating the HMI touchscreen and functions and recording all Owner comments, incorporate as many Owner review comments as possible before re-demonstrating the following day.
- G. Record Documents
 - 1. Compile a list giving each PLC program name, its installed version number, the number of copies installed, the serial number of each copy, the publisher's name and address, and the publisher's customer support telephone number.
 - 2. Prepare and submit complete documentation of the final installed runtime versions of the operator interface software, including a diagram of its component modules, subroutines, ladder logic, databases, libraries, drivers, and other parts. Narrative descriptions shall accompany the diagram, giving basic descriptions of each component and describing the interaction between components. Provide complete, annotated program listings of all custom scripts, macros, and subroutines.
 - 3. Provide the Owner with all original installation DVDs or CD-ROMs and all software manuals for every software program installed on the system. Provide one complete copy of the full development environment for the operator interface software installed on the programming laptop (refer to Section 28 23 00).

1.6 **WARRANTY**

- A. Comply with Section 28 05 00.
- B. Warrant all software development and programming to be free of defects for a period of one-year from the date of final acceptance. For warranty purposes, consider a defect to be any programming error or errant software behavior not explicitly agreed upon by the Owner, either intermittent or continuous, and all unincorporated Owner comments.
- C. Respond to reported defects with on-site personnel within the response times specified in Section 28 05 00.

PART 2 - PRODUCTS

2.1 **SOURCE QUALITY CONTROL**

- A. Factory Test:
 - 1. Comply with the requirements of Section 28 05 00.
 - 2. Functional Testing: Thoroughly test every function under all operating sequences and operating modes. Activate system outputs in response operations and test reactions to test inputs.

PART 3 - EXECUTION

3.1 **CUSTOMIZABILITY OF THE TOUCHSCREEN CONTROL SYSTEM**

- A. The sequence of operations presented in this Specification shall be open to customization by the City. Shapes of icons, size, arrangement, color, and even functionality shall be changeable as required by the City at no additional cost. Contractor shall submit a proposed design, including sample colored screen layouts, of how he/she intends on installing the Touchscreen controls interface. The included sequence of operations herein shall serve only as a basis of design, and does not exclude further development and customization required by the City.

END OF SECTION

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SECTION 28 46 19

PLC INTEGRATED CONTROL SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Programmable Logic Controllers (PLC)
 - 2. Power Supplies
- B. Related Work Under Other Sections
 - 1. Section 28 05 00 – Common Work Results for Electronic Safety and Security.
 - 2. Section 28 05 28 – Pathways for Electronic Safety and Security
 - 3. Section 28 15 00 - Intercom System
 - 4. Section 28 23 00 - Video Surveillance

1.3 SYSTEM DESCRIPTION

- A. The control electronics shall provide control and monitoring functions for systems and interfaces as described on the Drawings and in these Specifications.
- B. The controllers shall provide all necessary logic functions, timing functions, memory, software, input/output points and communication capabilities for the operating features required to meet all of the requirements of the Specifications and Drawings.
- C. The controller shall be general purpose in nature and not custom designed and built for this isolated application. The controller shall be generally non-location specific in its construction. The controller shall be made location specific and operationally customized by installing EPROM with applicable software, and making the I/O interface boards system specific and installing the proper I/O modules.
- D. Logic functions shall include, but not be limited to, AND, OR and INVERT functions with sufficient levels to provide operating features required to perform all of the functions required by the Specifications and Drawings.
- E. Timing functions shall include, but not be limited to, on-delay, off-delay, stepping and pulsing. Sufficient variations of programmable timing shall be available to provide all the operating features as required by the Specifications and Drawings.

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- F. Provide a daisy chain configuration network of PLCs to communicate all signals, between indicated PLC's in areas as shown on drawings.
- G. Provide a hot backup of all PLC CPUs for automatic switching upon primary CPU failure.
- H. The existing Jail has a Server Based PLC/HMI platform. Provide Schneider Electric Modicon M340 PLC platform with Ignition Server Based PLC/HMI. Provide with redundant servers (primary and failover).

1.4 **EXTRA MATERIALS**

- A. Deliver the following spare parts at a location to be designated:
 1. (1) PLC CPUs
 2. (1) input module per Chassis – minimum 64 point module installed in Chassis.
 3. (1) output module per Chassis – minimum 64 point module installed in Chassis.
 4. (1) network modules
 5. (1) PLC power supplies

PART 2 - PRODUCTS

2.1 **MANUFACTURERS**

- A. The control electronics shall be the product of a manufacturer engaged in the production of controllers for industrial applications for a minimum of ten (10) years. Only manufacturers with national distribution will be considered.
- B. Subject to compliance with requirements, provide video surveillance system equipment and components including, but not limited to, the following, without substitution. Provide the equipment shown below. The Contractor will be responsible for the design and operability of all system components of the final approved system. If any of the below components are no longer in production by the manufacturer, replace with an equivalent or better component. If any of the components cannot be found or are in question, provide and submit for approval a component of equal or better quality.
 1. PLC CPU and Controller - Schneider Modicon M580 Series
 2. PLC Input Module - Schneider Modicon X80 Series
 3. PLC Output Module - Schneider Modicon X80
 4. PLC Network Module - Schneider Modicon
 5. HMI Control Station - Elo 2770L and Dell Optiplex 7080/ Dell Precision 3460
 6. Server - Dell R330
 7. HMI Software - Ignition
 8. Monitor Mounts – Equal by Workrite Sequoia, Xybix

2.2 PLC GENERAL DESCRIPTION

A. General Description:

1. Environmental ratings for all components of the PLC system, except programming equipment, shall meet or exceed the following requirements:
 - a. Ambient Temperature rating of 0 to 60 C (32 to 140 F) operational and -20 to 70 C (-4 to 158 F) storage.
 - b. Humidity rating of 10% to 90% Relative Humidity (non-condensing).
 - c. All system modules shall be designed so as to provide for free airflow convection cooling. No internal fans or other means of cooling except heat sinks shall be required.
2. The PLC shall meet the following standards: UL Listed, CSA Certified, and CE.
3. The PLC and I/O modules shall be of modular and rack mounted construction.
4. The system power supplies shall be protected against short circuits.
5. Programmable controller manufacturer must guarantee the availability of replacement/spare parts for a minimum of ten (10) years.
6. All I/O modules and housings must be of a standard type and fully interchangeable with previous PLC series.
7. All controllers and I/O structures of a single manufacturer shall be capable of being mounted on the same size fixing centers to allow for larger capacity controllers to be installed in the future should the facility require an expansion beyond the limits specified in the original contract documents.
8. Controllers must be capable of driving local I/O racks, where local is defined as up to one hundred (100) feet from the control unit, without the need for further intelligent interface modules.
9. When required, the system must be capable of controlling remote I/O up to a distance of 500 meters (1,640 feet) from the controller, using high-speed links with a minimum data rate of one hundred and eighty seven (187) Kbaud. Communications over this link shall be accomplished using twisted-pair wires with an overall shield.

2.3 PLC CENTRAL PROCESSING UNIT

- A. The central processing unit (CPU) shall be microprocessor based, encased in a shielded enclosure to provide RFI protection, and shall provide the logic control functions and data transfer based upon the program stored in memory and the status of the inputs and outputs. The controller must be able to support up to 5,120 local I/O.
- B. The minimum standard control functions of the CPU shall include:
 1. Relay Ladder Logic
 2. Latching relays
 3. Timer clock pulses (.02s, 0.1s, 0.2s, 1s & 1m) and timers (.01 & 0.1 sec. Increments).

4. Counters (up/down)
 5. Data comparison (=, <, >), data range comparison, and data table comparison.
 6. Data transfers (single register, blocks of registers, data distribution and collection using pointer).
 7. Synchronous shift registers forward and reverse (multiple channel length bit shifts).
 8. One-shot output and input controls.
 9. Master control relays (interlocks).
 10. Bit reads and moves.
 11. I/O forcing and setting
 12. BCD to Binary or Hexadecimal conversion.
 13. Binary or Hexadecimal to BCD conversion.
 14. I/O Refresh on command, immediate I/O inputs, and scheduled interrupt on command.
 15. On-line program editing.
- C. The following minimum modes of operation of the CPU must be selectable via a key operated switch or programming software commands:
1. PROGRAM – Processor is not scanning program in memory and all outputs are held OFF.
 2. MONITOR – Processor is executing program and changes in user memory and data memory are allowed.
 3. RUN – Processor is executing program in memory and outputs are controlling to the program. No editing of program or data registers is allowed.
- D. The above settings shall require either a key, a programming console with a key, or programming software loaded on a computer to change the operating mode of the CPU.
- E. The processor shall incorporate extensive self-diagnostic, which will not halt the processor. In addition, separate visual indicators will annunciate at the following conditions:
1. POWER – Logic power is applied to the CPU and I/O rack from the power supply.
 2. RUN – Processor is executing the program in memory outputs are being controlled according to the program.
 3. OUTPUT INHIBIT – Processor is executing program in memory according to input status, but, outputs are being held in the OFF-state.
 4. ALARM – A non-fatal error (such as a low memory battery condition) has occurred in the PLC hardware or program software. The PLC is still running and the outputs are being controlled according to the program.

5. ERROR – A fatal error (such as a memory parity error) has occurred, the CPU is not scanning the program, and the outputs are held in the OFF-state.
 6. COMM – Indicating the CPU is communicating with the device connected to the peripheral port or RS-232C port.
- F. In addition to visual self-diagnostic indicators (LED's) the processor shall have a specifically designated block of a least 100 words of internal diagnostic words and bits. These shall provide more detailed system status and fault diagnostic information accessible by programming equipment or intelligent peripherals.
- G. The processor must contain an error log area. This area must be able to log what error occurred and when the error happened, giving exact time and date. This area must be able to store a minimum of 1000 records.
- H. At a minimum, the internal diagnostic registers shall the following information:
1. Type of digital (input or output) or intelligent (analog, ASCII, etc.) I/O unit inserted in a particular slot (I/O table listing). This data should be accessible via programming console or programming software.
 2. If an I/O module is improperly mounted (wrong slot) or not in a slot (I/O verify or I/O bus error).
 3. Error codes for intelligent I/O module errors.
 4. PLC operation mode.
 5. Present and maximum scan time.
 6. Local Area Network operation status and error status.
 7. Local Area Network data Send and Receive verification and error status.
 8. Serial Host Computer interface operation and error status.
 9. Remote I/O rack operation and error status.
 10. Memory Error Area.
 11. Startup time. The start time should be updated every time the power is turned ON.
 12. Power Interruption Time.
- I. A single RS232 or RS422 compatible or Fiber Optic
- J. Differential communication port shall be used for software based ladder logic programming and communications to other compatible devices. The PLC system must support up to three of these ports simultaneously.
- K. The data rate of the serial communications port shall be switch selectable. The following shall be the minimum available data rates: 300, 1200, 2400, 4800, 9600 and 19,200 baud.

2.4 INPUT/OUTPUT MODULES

- A. Each input or output module shall be a self-contained unit housed within an enclosure so that no part of its circuit board is exposed to contact by handling.
- B. Input and output units shall be UL listed, CSA certified and CE.
- C. Pressure type screw terminals will accept one No. 12 or two No. 14 stranded or solid wires.
- D. Convenience marker strips shall be provided adjacent to the I/O field wiring terminals for user labeling of all I/O points.
- E. It shall be possible to replace any I/O module without or disturbing user field wiring.
- F. Input and output modules shall be available in 8,16, 32, 64, and 96 points per unit. The 32, 64, and 96-point units shall not be multiplexed I/O and shall have a thumbscrew secured, high density connector capable of accepting individual soldered or crimped connector pins or ribbon cable via IDC type connector configuration.
- G. All high-density DC input or output units shall be solid state in nature. The output units shall be transistor type for long life and high DC reliability. Reed relays are not acceptable.

2.5 NETWORK OPTIONS

- A. Networking options must include Ethernet, Ethernet IP, Profibus DP, DeviceNet and Omron's SYSMAC bus remote I/O and ControllerLink network. Ethernet communications must support TCP, UDP, and FTP protocols. The PLC should have the ability to generate e-mail messages to be sent via WAN or LAN, to report errors, provide scheduled maintenance and status reports. In addition, FTP (file transfer protocol) can be used to transfer data files between a host computer and or FLASH memory card and the PLC's memory.

2.6 HMI CONTROL STATION PC

- A. Each Control Station PC shall function as the primary means of overall system control and monitoring. The computer equipment shall be arranged to present an efficient and organized appearance.
- B. The computer equipment shall be arranged to present an efficient and organized appearance. The following components shall be located with the workstation:
 - 1. PC based computer (with mouse and keyboard).
 - 2. 27" Touchscreen Monitor.
 - 3. Speakers.
- C. Provide computer equipment that meets the following minimum specification requirements
 - 1. Windows 11 Professional 64bit
 - 2. Intel® Core™ i7-6700 Processor (Quad Core, 8MB, 3.4GHz)
 - 3. 16GB (2X8GB) 2133MHz DDR4 Memory.

4. M.2 512GB PCIe NVMe Class 40 Solid State Drive
 5. Graphics – AMD Radeon R7 350X (4GB DP/DVI-I)
 6. 48X CD-RW and 8x DVD+/-RW 9.5mm Optical Disk Drive and fifty (50) CD's.
 7. Harman/Kardon HK-206 speakers, 3 watts each, 3 in. full range driver, 90 Hz-20Hz frequency response.
 8. Tower type chassis including high capacity power supply with surge suppressor.
 9. 101 key keyboard.
 10. Microsoft mouse.
 11. Communications – Integrated Gigabit Ethernet
 12. 3 PCI Expansion Slots
 13. (4) USB ports
 14. Parallel Printer Port
- D. Audio tone generator to activate on reception of an alarm. Audio tone shall be capable of being enabled or disabled on operator command.
- E. A touchscreen panel (monitor) shall be the primary means of operator access to the system. They shall provide the operator interface for control of the entire system. The touchscreen panel may be an "off-the-shelf" consumer grade panel, but must be secured using custom mounting for adjustable (horizontal, vertical, tilt, with lockable position) movement and minimize shake/torque while in normal operation.
- F. A keyboard and mouse are the secondary means of operator access to the system. To communicate with the direct digital control system, the operator shall input via the keyboard or mouse a command along with a proper alphanumeric identification of the system. Keyboard shall have standard ASCII coded logic outputs, providing full International English language displays and printouts. Auxiliary function keys shall be provided for various functions. These keys shall allow common operations to be performed by punching a single key instead of having to type out the command on the keyboard.
- G. A digital display clock shall display on the monitor at all times. Provision for manually resetting it shall be provided. It shall be a 24 hour real-time clock and seven-day calendar to provide data for logging.
- H. A network control key or software passwords shall allow automatic functions of the system to continue, but prevent unauthorized tampering with any computer pushbuttons or controls while the computer is unattended. This shall not disable the scanning or alarming functions.

2.7 SERVERS (PRIMARY AND FAILOVER)

- A. Provide server components that meet the following minimum specification requirements:
1. Intel Xeon E3-1220 CPU, 4 core, 3Ghz, 8M cache
 2. 8GB ECC RAM

PSB – Detention Area Automation Upgrades	City of Berkeley

3. 1TB 7200 RPM hard drive
4. Dual 1gb ethernet
5. iDRAC 8 basic
6. DVD ROM
7. Redundant power supplies

2.8 HUMAN MACHINE INTERFACE (HMI) SOFTWARE:

- A. Provide Software package with the following minimum requirements:
 1. 5 client access licenses
 2. Tag Historian Module
 3. OPC/UA Module
 4. Modbus Driver
 5. Redundant Server License for hot standby server with the same configuration as primary server.
- B. Software Architecture General Design Features:
 1. The HMI package shall:
 2. Be 64-bit software capable of running on operating systems currently supported by the latest 5 Microsoft operating system platforms.
 3. Support and take advantage of multiple processors on the same machine (symmetric multiprocessor design). For example, adding another chip to the computer should distribute the load of the HMI software across both chips, thereby increasing performance, etc.
 4. Support and take advantage of multiple threads within the CPU. This multi-threading, among other benefits, aids in multi-tasking for CPU optimization, dependencies, and the like.
 5. Have a scalable architecture such that the user can start with a small application and later grow the application database to any size by upgrading the license.
 6. Embrace and integrate Microsoft Standards including:
 - a. Microsoft Access
 - b. Microsoft SQL Server
 - c. Microsoft Data Engine (MSDE)
 - d. Open Database Connectivity (ODBC)
 - e. ADO, OLE-DB for Database Interface
 - f. Object Linking and Embedding (OLE)
 - g. ActiveX Technologies

- h. OLE for Process Control (OPC)
- 7. Have the ability to write scripts within the package using a non-proprietary language (e.g.: VBScript).
- 8. Must support modifications in the driver worksheet to allocate addresses in the PLC (to maintain flexibility on the PLC supplier).
- C. Must be supported and have recognized partnership with over 10 different PLC Controllers.
- D. Must have at minimum 10 certified distinct system integrator companies in the State of California on the HMI solution.
- E. Must have at minimum 10 distinct distributors in the United States.
- F. Networking:
 - 1. The HMI package shall:
 - a. Implement Client / Server Distributed Networking.
 - b. Support industry standard network protocols such as Ethernet (TCP/IP and UDP/IP) and EthernetIP as well as all Omron legacy networks (Controller Link, SYSNET, etc.), without any OPC interface.
 - c. Operate on a network with multiple protocol stacks.
 - d. Plug and Play with standard routers, switches, network Intranets and the Internet.
 - 2. Support, where applicable, a Web based Browser Plug-in so that Alarming, Graphics, Trends can be viewed from any Internet Explorer station in addition to alarming through any Microsoft based operating system. Also, it will permit interaction (e.g., changing set point, switching screens, etc.) from these dedicated Internet Explorer stations.
 - 3. Be configurable as an independent distributed database regardless of the number of nodes in the system.
 - 4. Support at least 256 workstations (nodes) simultaneously.
 - 5. Expansion of the system shall be possible with the addition of non-proprietary PC based off the shelf hardware.
 - 6. Connect to a large number of I/O Device Interfaces via OPC Servers across the network.
 - 7. Allow different versions of the development environment to reside simultaneously on the same computer, under different directories.
 - 8. Have the ability to exchange data with external SQL Relational Databases, via 3rd party ADO providers, without the addition of any add-on packages.
 - 9. Have the ability to save alarm history and event history to any SQL Relational Database, via 3rd party ADO providers, without the addition of any add-on packages.
- G. Graphic Display Software Module:

1. The graphical display module shall have the ability to:
 - a. Allow configuration of highly detailed screens with animation.
 - b. Use an object-oriented design.
 - c. Permit using the mouse for object creation, editing, and placing on the screen.
 - d. Show object properties for customization with either menu choices, right-clicking, pop-up menus, or double-click shortcuts.
 - e. Offer floating, dockable tool bars with drawing and animation tools for building the display.
 - f. Provide a grid that can be displayed on screen to assist in aligning objects precisely.
 - g. Permit re-sizing of the grid in both the X and Y direction (independently) in one-pixel increments.
 - h. Allow "Snap to Grid" functionality to be turned on/off during configuration.
 - i. Not require compilation of the displays before use; a simple "save" is all that is needed for use.
 - j. Offer Password Protection of displays created.
 - k. Provide language switching "on the fly"; with the ability for user-created displays to change languages, as well as the menus and tools employed by the graphics package itself.
 - l. Display the graphic interface in 2 monitors connected to the same computer (CPU). The graphic interface available on each monitor must provide independent screen navigation.
 - m. Run more than one instance of the graphic interface on the same computer (Thin Client solution) without any additional configuration on the Server station.
 - n. Create tags as structures/classes of at least one member.
 - o. Create array tags and configure another tag as its index when configuring objects on the screen.

H. Alarms and Events:

1. The alarm system shall provide complete alarm and event management with a user-definable message structure.
2. The alarm system shall provide 16 message sub-classes and 16 message types.
3. The alarm system shall provide the ability to condense system alarming by the provision of group messages/alarms.
4. The alarm system shall be programmed to alarm any change of state that the system detects, including:
 - a. The failure of communications channels used by the system.
 - b. The failure of system's hardware which results in an automatic fail-over of the system's functions from the active to standby server.

5. The alarm system shall be capable of annunciating alarms, including, but not limited to:
 - a. Activation of an audible alarm or light.
 - b. Alarm display updated with the current alarm.
 - c. Alarm banner updated on configured process displays.
6. The alarm system shall display alarm messages in a manner to facilitate easy interpretation of current alarms, including, but not limited to:
 - a. Different text color and background color for those points that are in alarm, those that have been acknowledged, and those that are no longer in alarm.
 - b. Flashing of the current alarm message(s) in the alarm list.
7. The alarm system shall provide capability to acknowledge alarm message when data point enters and/or exits alarm state. The system shall permit alarm acknowledgement, including, but not limited to:
 - a. On an individual point.
 - b. On a filtered group of points.
 - c. On all alarms.
8. The alarm system shall provide filtering to control the alarms display. The filtering shall include, but not be limited to:
 - a. Date.
 - b. Time.
 - c. Alarm class.
 - d. Alarm type.
 - e. Alarm priority.
 - f. Status (in alarm, out of alarm, or acknowledged).
 - g. Any defined alarm message field.
9. Alarm colors vary by equipment served. Alarms colors shall visually annunciate to meet site requirements.

I. Security:

1. The software shall provide a security component for restricting access to different areas of the system.
2. It shall be possible to configure different sets of individual users (range at least 1 to 1000 users) as well as categorizing those users (e.g., engineers, operators, supervisors, etc.) into groups (range at least 1 to 100 groups).
3. It shall be possible to assign a person to more than one group (e.g., Engineer and a Supervisor).
4. For each individual user, and for each group, it shall be possible to define:
 - a. Name.

- b. Password, including such parameters as minimum length required, time allowed before it must be changed, and uniqueness over time).
 - c. Data Points which can and cannot be written to.
 - d. Which screens they have access to.
- 5. It shall be possible to configure an Auto-Logout period, whereby the user is automatically logged out of the system after a specified amount of time has elapsed.
- 6. Restrictions on software module interaction shall be configured on a per-user and per-group basis. Items to lock out include:
 - a. Exiting the applications.
 - b. Printing.
 - c. Entering Configuration Mode.
 - d. Switching Languages.
 - e. Starting/Stopping of Alarm and/or Data Logging.
 - f. Acknowledgement of Alarms.
 - g. Alarm Filtering.
 - h. Changing Zoom Factors in Graphics and Trends.
 - i. Modifying and Executing Trend Reports.
 - j. Adding, Editing and/or Deleting Trend Pens.
 - k. Running a Script.
 - l. Accessing the Windows Desktop.
- 7. If a user fails to successfully log in after a configurable number of times, it shall be possible to lock that account out until either an administrator clears it, or after a preset amount of time has elapsed.
- 8. A utility shall be provided to show which users are logged into the system (both on the local machine, and on networked machines).
- J. Internet Connectivity:
 - 1. A stand-alone Web Server software module shall be provided so the HMI software can be accessed over the Internet.
 - 2. The Web Server module shall run under Windows NT, embedded NT, and Windows 2000.
 - 3. A user shall only require Internet Explorer to be installed on their machine (Thin Client) to access the system, with any "Plug-ins" automatically installed for them by the Server when they first access a graphic, trend, or alarm screen.
 - 4. A mechanism shall be provided to deliver the software and data updates through firewalls.

5. The Web Server module shall manage the number of concurrent users of the Internet connection. Software licensing agreements shall be provided to allow for six (6) concurrent users.
6. It shall be possible to have “floating” web licenses, whereby if one user logs off, that license is freed up so that another user can log in.
7. The same security system employed by the HMI software shall also manage users connecting via the web.
8. The graphics files shall be represented over the web in the same manner as shown on a “standard” HMI workstation (i.e., close-approximations via HTML are NOT acceptable: the graphics should look and interact the same as a regular station).
9. Anywhere a file path name can be used within the graphics software, a URL shall also be able to be specified.
10. Alarms on a web station shall look and interact the same as a standard workstation.
11. Trend View windows on a web station shall look and interact the same as a standard workstation.
12. A “standard” workstation user shall also be able to connect to a networked system of other “standard” workstations via the Internet.

K. OPC Data:

1. If OPC databases are used, must be able to import OPC tags
2. The OPC Browser shall list all registered OPC Data Servers when making a connection to I/O data, and OPC Alarm and Event Servers when configuring alarms, and OPC Historical Data Access servers when configuring trending applications.
3. It shall be possible to browse OPC Servers installed on the local machine as well as those installed on any node visible on the network.
4. Ability to keep OPC tags on scan to optimize communications to commonly used data items.
5. On-line OPC Data Configuration changes (e.g., adding a new tag on-line) shall be supported by the HMI package.
6. OPC Data Ranges shall be read in and used to configure limits on graphic dynamics, trend limits, data entry field ranges, and so on.
7. OPC Quality Flags shall be used in graphic dynamics (degrees of communication quality shall be indicated by change in color used for objects), data logging, and alarm presentation.
8. A component for bridging/mapping OPC Data from one server to another shall be provided (e.g., map an PLC data point to a Modbus register).

L. Historical Data:

1. The system shall provide a complete historical subsystem providing the user the capability to capture and analyze historical data.

2. There shall be no limit (other than storage capacity) on the number of archives that can be created. The system shall also allow selection of any point in the system to be added/configured for archiving.
3. The historical subsystem shall use standard Windows tree/list view presentation techniques to facilitate the display and editing of archive timers, archive types, graphical data displays and tabular data displays.
4. The historical subsystem shall promote the visualization of historical data in both tabular and graphical form. This includes the capability to view historical data via a web-enabled interface as specified herein.

M. Reports:

1. 1. The system shall provide an integral reporting subsystem used to report both current and archived data.
2. The reporting subsystem shall provide the capability define reports for both visualization and printed format.
3. The reporting subsystem shall provide the capability to define both the dynamic and static properties reports, including, but not limited to:
 - a. Inclusion of archived data, alarm data or event data.
 - b. Customization of the format, layout, and graphical images, included on a report.
4. Configuration of automatic report generation, including frequency, destination of the report, and a prioritized list of alternate system resources should problems be encountered during automatic production.
5. The system shall be supplied with pre-configured reports, including, but not limited to:
 - a. Graphic display documentation.
 - b. Historical archiving.
 - c. Alarm archiving.
 - d. Control logic/scripting configuration.
 - e. User and group security configuration
6. The reporting subsystem shall not impose limits on the number of reports that can be configured.

N. Database:

1. The system shall utilize a real-time relational database for storage of all process related data.
2. The database shall be based on an accepted industry standard database technology.
3. Tag names should be able to support up to 255 characters
4. The database subsystem shall provide the capability of “browsing” an application database, independent of the application.

5. The database system shall support both internal (computational) and external tags (real world). Use of internal tags shall be unlimited.
6. The database system shall provide the ability for each tag (dependant on type) to have high and low limits, start and substitute values.
7. The database system shall provide for event driven execution for data processing. Systems that require external data sources (PLCs) be polled for complete database update shall not be accepted.

O. Client/Server:

1. The software shall employ native client-server architecture. The architecture shall promote the use of multiple server and multiple client (i.e., workstation) configurations.
2. Any server computer shall be able to be dedicated to specific process functionality (i.e., Alarm Service, Historical Data Collection, etc.)
3. All clients shall have the capability to locally store and utilize process displays, as well as local control actions. Should a requested display and/or control action not exist locally at the client level; the client will access the data for the server. This operation will be transparent to the user.
4. All clients shall have complete visibility to all servers, and all servers shall have visibility at the peer level.
5. The software shall promote portability of applications between computers without any redevelopment or modification.
6. It shall be possible for the user to monitor and control the process from client or server. This includes, but is not limited to:
7. View the same or different displays simultaneously.
8. Make process adjustments and acknowledge alarms.
9. View alarms, events, trends, and reports.
10. The development and runtime environments shall be decoupled allowing the user to configure run-time only clients without any development capabilities. Modification of a client from run-time only, to runtime/development, shall be achieved as a simple license upgrade. Reinstallation or new installation of software will be permitted to achieve this functionality.
11. The system shall support implementation of thin-client technology.
12. The HMI system shall support thin-client platforms from PDAs to Industrialized PCs.

P. Redundancy:

1. To maximize data availability and integrity, the system shall provide the ability for configuration of system redundancy.
2. Configuration of system redundancy shall in no way limit or restrict the use of the client/server configuration and/or architecture.

3. Clients shall automatically “failover” to the backup or redundant server. This operation shall not require any application reprogramming or reconfiguration.
4. Once a failed server becomes available, the active server shall checkpoint data missing data to the previously failed server. This operation shall occur in the background, and shall not effect the operation of the on-line server.

2.9 CPU CABINET

- A. CPU Cabinet shall be a fully enclosed cabinet to house the CPU.
- B. Shall have fans for ventilation.
- C. Shall be lockable.
- D. Shall be off-the-shelf (not custom sized).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with Section 28 05 00.
- B. Comply with manufacturer's recommendations, procedures and standards for the assembly and operation of the Control Electronics.
- C. Common functions such as sallyport interlocks shall be wired to a single system. This type of function shall not be networked.

3.2 TRAINING

- A. Comply with Section 28 05 00, TRAINING.

END OF SECTION

BIDDERS AND CONTRACTORS CHECKLIST

Items Required at Bid Opening: 2:00 PM, Thursday, February 19, 2026, at City of Berkeley, Purchasing Manager's Office, Martin Luther King Jr. Civic Center, 2180 Milvia Street, Third Floor, Berkeley, CA 94704

Envelope A

- ☐ Bid Form (Document 00 4113)
- ☐ Bond Accompanying Bid (Document 00 4313)
- ☐ Bidder Registration and Experiencing Form (Document 00 4314)
- ☐ Subcontractor List (Document 00 4330)
- ☐ Non-Collusion Affidavit (Document 00 4519)
- ☐ Bidder Certification (Document 00 4546)

Envelope B

- ☐ Statement of Qualifications for Construction Work (Document 00 4513)

Items Required after Notice of Intent to Award for Construction (Document 00 5100):

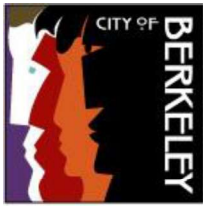
- ☐ Agreement (Document 00 5200)
- ☐ Construction Performance Bond (Document 00 6113.13)
- ☐ Construction Labor and Material Payment Bond (Document 00 6113.16)
- ☐ OPTIONAL - Escrow Agreement for Security Deposit in Lieu of Retention (Document 00 6290)
- ☐ Insurance Certificates with Endorsements (Document 00 7316)
- ☐ City of Contracting Policies (Document 00 6580)
 - ☐ Memorandum of Understanding
 - ☐ Workforce Composition Form (to be completed by Contractor and any Subcontractors who will do work valued at \$3,000 or more)
 - ☐ Agreement for Change in Subcontractors (List all Subcontractors, Contractor to sign and date)
 - ☐ Nuclear Free Zone Disclosure Statement
 - ☐ Oppressive States Compliance Statement
 - ☐ Hardwood Disclosure Form
 - ☐ First Source Construction Agreement (for projects between \$100,000 and \$500,000)
 - ☐ Community Workforce Agreement, Agreement to be Bound (for projects over \$500,000; to be completed by Contractor and any Subcontractors who will do work valued at \$3,000 or more)
 - ☐ Certificate of Compliance with Equal Benefits Ordinance
 - ☐ Taxpayer Identification Report
 - ☐ Right to Audit Form
 - ☐ Sanctuary City Compliance Certificate
- ☐ Contractor's License
- ☐ City of Berkeley Business License
- ☐ Vendor Application Form (if not current City vendor)
- ☐ IRS Form I-9 (if not current City vendor)

Items Required During Construction:

- ☐ Progress Schedules and Submittals (Document 01 3230)
- ☐ Monthly Progress Payment Applications (Document 01 2000)
 - ☐ Weekly Certified Payroll Statements for period of Progress Payment Application
 - ☐ First Source Agreement OR Community Workforce Agreement Monthly Reports

Items Required Upon Completion of Project for Final Payment:

- ☐ Agreement and Release of Any and All Claims (Document 00 6530)
- ☐ Guaranty (Document 00 6536)
- ☐ Warranties (Document 01 7700)
- ☐ Closeout Submittals (Document 01 7800)



Permit Service Center
Building & Safety Division
Planning and Development Department

Permit Application Approved

Application #: B2024-04554

June 26, 2025

Project Address: 2100 M L King Jr Way

Dear Project Applicant,

The City of Berkeley has completed review of the construction documents submitted under the building permit application number specified above. This permit is approved with conditions, and will be issued upon payment of outstanding fees, and completion of conditions of approval documentation listed below.

Conditions of approval for permit issuance:

1. **The completed and signed [Permit Declarations](#) form is required for permit issuance. Select ONE of the options below:**
 - a) **Property Owners:** If the property owner completes and signs the permit declarations form, they must also provide a completed [Owner Builder Verification](#) form, with notarization or a copy of the owner's ID for verification purposes
 - b) **Contractors:** Must hold a current City of Berkeley business license. For information about business license application and renewals, visit <https://berkeleyca.gov/doing-business/operating-berkeley/business-licenses>
 - c) **Owner's Agent:** If the owner's agent signs the permit declarations form, the agent must provide the [Authorization of Agent](#) form and [Owner Builder Verification](#) form, completed by the property owner, with notarization or a copy of the owner's ID for verification purposes
2. Submit completed [Permit Application Fee Schedules](#) to obtain electrical and mechanical permits. **Note: As of January 1st, 2023 an automatic gas shut off valve shall be installed when a plumbing or mechanical permit is issued for work on any building containing fuel gas piping [BMC 19.34.040 section 1209.4].**
3. Submit completed [Construction Waste Management Plan](#), including GreenHalo tracking number, prior to permit issuance.
4. Submit completed [Special Inspections](#) form, listing selected [approved agencies](#), and including signatures of all required parties, prior to permit issuance.
5. Provide payment for outstanding permit fees, totaling \$12,479.60.

This amount does not include itemized fees for electrical and mechanical permits. Additional fees may apply..

*See Document Submittal Instructions at the end of this letter.

Document Submittal Instructions

All required forms may be downloaded from the City of Berkeley website forms page at <https://berkeleyca.gov/construction-development/permits-design-parameters/permit-types/permit-forms>

For permit issuance, follow the instructions for payment and document formatting below.

Document formatting requirements:

- All permit documents must be submitted in electronic format, as unsecured PDF files.
- Documents with multiple pages must be combined and named according to content.
- Documents that are incomplete or improperly formatted will not be processed.

Document submittal options (choose one):

1) Permits Online:

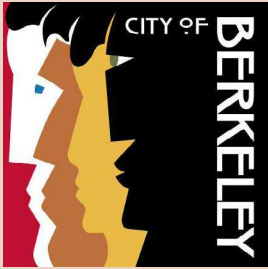
- Conditions of approval documents:** Upload submittal documents directly to the permit record at the [Permits Online Portal](#), by selecting *Record Info > Attachments > Add*. Permit documents are accessible from the registered Accela Citizen Access (ACA) account associated with the permit.
- New/separate permit:** Generate new request from a registered ACA account at the [Permits Online Portal](#). Submit request under 'Building Permits' for work on private property, or 'Public Works' for work in the public right of way.

- In-Person:** Schedule an appointment for in-person processing through the [Permit Service Center webpage](#). Note that for all in-person submittals, documents must be saved on a USB thumb drive.

Payments may be made online at the [Permits Online Portal](#), by opening the permit record, and selecting *Building Permits > Payments > Pay Fees*. In-person payments may be made Mon-Thurs from 8:30AM and 2:00PM. Checks may be mailed to the address below.

Expiration of an issued permit: Permits issued by the building official shall expire one year from the date of issuance. The building official or the supervising building inspector are authorized to grant one or more extensions of time to complete the work for additional periods not exceeding one year per extension. The extension shall be requested in writing and justifiable cause demonstrated. Requests for time extensions shall be accompanied by the payment of a fee set by resolution of the City Council. [BMC 105.5]

To apply for an permit extension, complete an [Permit Extension Request](#) form, and choose one of the two submittal options listed above.



**Building and Safety
Permit Service Center**

Permit Declarations are required to be completed and signed at permit issuance.

For verification purposes, a copy of the property owner's driver's license, state issued identification card, passport, or form notarization is required to be presented at permit issuance and payment of permit fees.

Licensed Contractors must complete the following:

- Licensed Contractor's Declaration and Information
- Worker's Compensation Declaration

Property Owners and Owner's Agent must complete the following:

- Owner Builder Declaration
- Owner-Builder Verification and Limitation of Sale (separate form)
- Authorization of Agent (separate form required for owner's agent)

Contractors State License Board website:
www.cslb.ca.gov

Permit Service Center
1947 Center St. 3rd floor
Berkeley, CA 94704
510-981-7500 TTY 6903
permits@cityofberkeley.info

PERMIT DECLARATIONS

Project Address:
Permit Number:

LICENSED CONTRACTOR'S DECLARATION AND INFORMATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

Company Name:
License Number: Class: Exp. Date:

OWNER BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the Contractors' State License Law for the reason(s) indicated below by the checkmark(s) I have placed next to the applicable item(s) (Section 7031.5, Business and Professions Code: Any city or county that requires a permit to construct, alter, improve, demolish, or repair any structure, sidewalk, or street prior to its issuance, also requires the applicant for the permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors' State License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code) or that he or she is exempt from licensure and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars (\$500).

- ☐ I, as the owner of the property, or my employees with wages as their sole compensation, will do ☐ all of or ☐ portions of the work, and the structure is not intended or offered for sale (Section 7044, Business and Professions Code: The Contractors' State License Law does not apply to an owner of property who, through employees' or personal effort, builds or improves the property, provided that the improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the Owner-Builder will have the burden of proving that it was not built or improved for the purpose of sale).
- ☐ I, as the owner of the property, am exclusively contracting with licensed Contractors to construct the project (Section 7044, Business and Professions Code: The Contractors' State License Law does not apply to an owner of property who builds or improves thereon, and who contracts for the projects with a licensed Contractor pursuant to the Contractors' State License Law.) **Completion of the contractor's information above is required.**
- ☐ I am exempt from licensure under the Contractors' State License Law for the following reason:

By my signature below, I acknowledge that, except for my personal residence in which I must have resided for at least one year prior to completion of the improvements covered by this permit, I cannot legally sell a structure that I have built as an owner-builder if it has not been constructed in its entirety by licensed contractors. I understand that a copy of the applicable law, Section 7044 of the Business and Professions Code, is available upon request when this application is submitted, and can be found at the following website:
<http://leginfo.legislature.ca.gov/>

WORKER'S COMPENSATION DECLARATION

Warning: Failure to secure workers' compensation coverage is unlawful, and shall subject an employer to criminal penalties and civil fines up to one hundred thousand dollars (\$100,000), in addition to the cost of compensation, damages as provided for in section 3706 of the Labor Code, interest, and attorney fees.

I hereby affirm under penalty of perjury one of the following declarations:

- ☐ I certify that the permit valuation is for five hundred dollars (\$500.00) or less, and therefore exempt from workers' compensation as provided for by Section 7048 of the Business and Professions Code.
- ☐ I have and will maintain a certificate of consent to self-insure for workers' compensation, issued by the Director of Industrial Relations as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. **Certificate Number:**
- ☐ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

Carrier Name:

Policy Number:

Expiration Date:

Name of Agent:

Phone Number:

- ☐ I certify that, in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that, if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

CONSTRUCTION LENDING AGENCY DECLARATION

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Section 8172, Civil Code).

Lender Name:

Branch Designation:

Lender Address:

CITY ORDINANCES DECLARATIONS

- ☐ I understand my obligation to perform construction related work within prescribed hours as set forth in the City of Berkeley Noise Ordinance and/or Use Permit conditions. BMC 13.40.070
- ☐ I am aware of my responsibilities under the Relocation Ordinance. BMC 13.84
- ☐ I certify that I have read and shall use applicable portions of the State Storm Water Best Management Practices Manual for Construction to the maximum extent practicable.

LEAD HAZARD DECLARATION

- ☐ I am aware of my responsibilities to implement lead-safe work practices as required by the State of California Health and Safety Code Sections 17920.10 and 105256 when conducting renovation, repair, or painting work in pre-1978 residences, childcare facilities, or schools. I will ensure that any paint disturbing work will be done by or supervised by RRP certified individual(s). Failure to follow this rule may result in enforcement action by the EPA.

BAAQMD DECLARATION

- ☐ I am aware of my responsibilities to comply with the requirements of the Bay Area Air Quality Management District (BAAQMD) Regulation 11, Rule 2 pertaining to disturbing regulated asbestos-containing materials (RACM).

CERTIFICATE OF INDEMNIFICATION

- ☐ I hereby agree to defend, indemnify and hold harmless the City of Berkeley and it's officers and employees from any and all claims arising from work connected to this permit.

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION OF ENTRY

- ☐ I agree to comply with all state laws and city and county ordinances relating to building construction and authorize a representative of the City of Berkeley Building and Safety Division to enter upon the property for which I have applied for this permit for the purpose of making inspections.

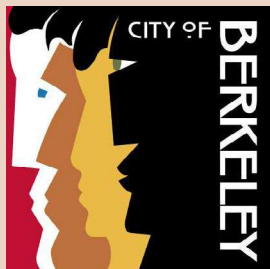
By my signature below, I hereby affirm under penalty of perjury that each of the above declarations are true.

Check One: ☐ Contractor ☐ Owner ☐ Owner's Agent

Name

Signature

Date


**Building and Safety
Permit Service Center**

All plans and supporting documents must be submitted in electronic format as unsecured, flattened PDF(s) with embedded fonts. Minimum 11"x17" sheet size.

The valuation used in computing the building permit fee shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. BMC Section 19.28.20.

California Licensed General, Electrical, Mechanical, and Plumbing Contractors are required to have a City of Berkeley Business License and must provide Worker's Compensation Carrier and Policy Number prior to or at the time of permit issuance.

Permit Service Center

1947 Center St. 3rd floor
Berkeley, CA 94704
510-981-7500 TTY 6903

[permits@
cityofberkeley.info](mailto:permits@cityofberkeley.info)

PERMIT APPLICATION

Building - Electrical - Mechanical - Plumbing - Sign

Project Information

Permit #:

Address:

Valuation:

APN:

Parcel Conditions

 Fire Zone: ☐ 1 ☐ 2 ☐ 3 ☐ Landslide Area ☐ Alquist Priolo

 Flood Zone: ☐ A ☐ B ☐ C ☐ Liquefaction Zone ☐ Creek on the Parcel

Project Specific Information

 Occupancy: ☐ Single-Family/Duplex/ADU ☐ Multi-Family ☐ Commercial/Industrial

 Work Type: ☐ New ☐ Addition ☐ Alteration ☐ Demolition ☐ Sign

Other:

 Permit(s): ☐ Building ☐ Electrical ☐ Mechanical ☐ Plumbing

 Description
of Work:

 Work in the public right of way is required: ☐ Yes ☐ No

	Construction Type	Occupancy Class	Square Footage	No. of Stories	No. of Residential Units	No. of Bedrooms
Existing						
Proposed						

 Residential Rental Units: ☐ Yes ☐ No Is tenant relocation required? ☐ Yes ☐ No

Applicant Information ☐ Owner ☐ Agent ☐ Contractor ☐ Design Professional

Name:

Phone #:

Company:

Bus Lic #:

State Lic #:

Lic Class:

Address:

City, Zip:

Email:

Owner Information

Name:

Phone:

Address:

City/ST/zip:

Email:

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Project Information

Permit #:

Address:

Mechanical Permit Fees (Minimum \$127.00)

Qty	Fee Item	Fee
	Minimum Mechanical Permit Fee includes:	
1	• Mechanical Filing Fee	\$22.00
1	• Mechanical Minimum Permit Fee	\$100.00
1	• Mechanical Technology Fee	5%
	Air Handling Equipment <i>Up to 10,000CFM</i>	\$26.30
	Air Handling Equipment <i>Over 10,000 CFM</i>	\$39.30
	Boilers and Equipment ² <i>Up to 100 kBTU</i>	\$39.90
	Boilers and Equipment ² <i>100 - 500 kBTU</i>	\$54.00
	Boilers and Equipment ² <i>Over 500 kBTU</i>	\$129.00
	Central Heating ² <i>Up to 100 kBTU</i>	\$39.70
	Central Heating ² <i>100 - 500 kBTU</i>	\$54.00
	Central Heating ² <i>Over 500 kBTU</i>	\$129.00
	Ducts, Fans, Registers, Dampers	\$11.90
	Gas Appliances (1-2)	\$13.00
	Gas Appliances (3+)	\$12.00
	Gas Pipe Outlets ^{1,3}	\$5.60
	Gas Piping Extension, Alteration or Repair ^{1,3}	\$12.20
	Gas Pressure Test ¹	\$14.10
	Gas Meters ^{1,3} <i>New or Changed</i>	\$13.10
	Hoods Commercial ² <i>Type I</i>	\$129.00
	Hoods Commercial ² <i>Type II</i>	\$79.70
	Hoods Residential ²	\$11.80
	Permit Extension	\$57.00
	Pre-fab. Fireplaces ²	\$79.70
	Vent, Flue, Chimney	\$13.10

1. Do not duplicate fees for gas work on mechanical and plumbing fee schedules

2. Includes attached ducts, flues, vents, registers, and associated electrical, except a new circuit run from panel

3. Includes Pressure Test

Electrical Permit Fees (Minimum \$127.00)

Qty	Fee Item	Fee
	Minimum Electrical Permit Fee includes:	
1	• Electrical Filing Fee	\$22.00
1	• Electrical Minimum Fee	\$100.00
1	• Electrical Technology Fee	5%
	A. New Residential Buildings & Additions	
	• Includes Device Outlets	\$15.00
	• Per 100 Sq Ft - Enter Total Sq Ft	
	B. Non-Residential Electrical Permit	
	• \$100,000 min valuation of electrical work	1%
	• Includes all itemized fees list below	
	• Enter total valuation of work	
	C. Itemized Fees:	
	Altering/Changing Wiring	\$26.10
	Branch Circuits	\$4.70
	Device Outlets <i>Receptacle, Switch, Light</i>	\$2.70
	Electrical Meters <i>New or Changed</i>	\$7.20
	Electrical Permit Extension	\$57.00
	Electrical Vehicle Charging Station	\$15.90
	Festoon Lighting	\$10.00
	Fixed Appliance Outlet	\$11.10
	Generators - up to 10KV <i>Total KV</i>	\$7.20
	Generators - over 10KV <i>Total KV</i>	\$1.90
	Motors - up to 10 HP <i>Total HP</i>	\$7.20
	Motors - over 10 HP <i>Total HP</i>	\$1.90
	PG&E Service Recheck	\$11.90
	Service - New or Changed <i>Total Amps</i>	\$11.90
	Signs and Outline Lighting	\$26.50
	Solar Photovoltaic System	\$26.10
	Subpanel - New or Changed <i>Total Amps</i>	\$11.90
	Temporary Power Pole	\$26.50
	Transformers - up to 10 KV <i>Total KV</i>	\$4.80
	Transformers - over 10KV <i>Total KV</i>	\$1.90
	X-Ray Capacitors	\$26.50

Plumbing Permit Fees (Minimum \$127.00)

Qty	Fee Item	Fee	Qty	Fee Item	Fee
1	Minimum Plumbing Permit Fee includes:			B. Itemized Fees (continued):	
1	• Plumbing Filing Fee	\$22.00	☐	Plumbing Permit Extension	\$57.00
1	• Plumbing Minimum Permit Fee	\$100.00	☐	Pressure Test <i>Water or Air</i>	\$14.40
1	• Plumbing Technology Fee	5%	☐	Removal of Illicit Connections	\$12.20
☐	A. New Residential Buildings & Additions		☐	Sanitary Sewer Lateral	\$34.00
	• Includes fixtures & interior water lines	\$15.00	☐	Seismic Gas Shut-Off Valve	\$10.00
	• Per 100 Sq Ft - <i>Enter total Sq Ft</i>		☐	Seismic Gas Shut-Off Valve 2+ <i>Group Permit</i>	\$50.00
	B. Itemized Fees:		☐	Solar Water Heater	\$12.20
☐	Fixtures <i>include sanitary drainage/venting</i>	\$12.20	☐	Stand Pipe System	\$129.10
☐	Gas Pipe Outlets ¹	\$5.60	☐	Subsoil Storm Drainage Piping	\$34.00
☐	Gas Piping Extension/Alteration/Repair ¹	\$12.20	☐	Swimming Pool Filtration System	\$129.10
☐	Gas Pressure Test Only ¹	\$14.10	☐	Water Heater	\$12.20
☐	Gas Meters <i>New or Changed</i> ¹	1 \$13.10 2+ \$9.10	☐	Water Line <i>Total Outlets</i>	<26 \$24.90 26+ \$2.70
☐	Graywater System <i>Single Family Dwelling, Duplex or ADU</i>	\$39.90	☐	Water Line <i>Hydronic Water Piping</i>	\$24.90
☐	Graywater System <i>All Other Occupancies</i>	\$105.70	☐	Water Main <i>Total Outlets</i>	<26 \$24.90 26+ \$2.70
☐	Inside Rain Leader	\$27.40	☐	Water Meters <i>New or Changed</i>	1 \$14.40 2+ \$8.40ea
☐	Lawn Sprinkler System <i>Single-Family Dwelling, Duplex or ADU</i>	\$39.90	☐	Water Meters <i>Backflow Preventer</i>	\$12.20
☐	Lawn Sprinkler System <i>Other Occupancies</i>	\$105.70			
☐	Nonpotable Rainwater Catchment System <i>Single-Family Dwelling, Duplex or ADU</i>	\$39.90			
☐	Nonpotable Rainwater Catchment System <i>Other Occupancies</i>	\$105.70			

1. Do not duplicate fees for gas work on mechanical and plumbing fee schedules

Contractor Information for Electrical, Mechanical and Plumbing permits

☐ General
 ☐ Mechanical
 ☐ Electrical
 ☐ Plumbing

Name: Phone: Bus Lic #:

Company: State Lic #: Lic. Class:

Address:

Email:

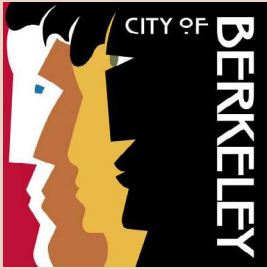
☐ General
 ☐ Mechanical
 ☐ Electrical
 ☐ Plumbing

Name: Phone: Bus Lic #:

Company: State Lic #: Lic. Class:

Address:

Email:



**Building and Safety
Permit Service Center**

Complete this form and submit it along with your building permit application when performing the following activities:

1. Any non-residential projects requiring building permits.
2. Residential new buildings.
3. Residential projects that increase a building's conditioned area, volume, or size.
4. Residential projects valued over \$100,000.
5. Demolition permits valued over \$3,000.

A minimum of 65% of the waste generated by construction and demolition activities must be diverted away from landfill disposal through any combination of recycling, salvage, reuse or composting. 100% of asphalt, concrete, and land clearing debris must be recycled.

Building and Safety
1947 Center St. 3rd floor
Berkeley, CA 94704
510-981-7440 TTY 6903
buildingandsafety@berkeleyca.gov

CONSTRUCTION WASTE MANAGEMENT PLAN

Project Information

Permit Number:

Project Address:

Construction Methods

- ☐ Waste generated during construction will be minimized through a combination of efficient design, careful and accurate material ordering, handling and storage, panelized or prefabricated construction, reuse, and/or salvage.

Universal and Hazardous Waste

Disposal of asbestos-containing materials, batteries, electronic waste, fluorescent bulbs, lead based paints, mercury containing equipment and refrigerants, require special processing prior to commencement of construction or demolition activities. Additional information can be found at the [Bay Area Air Quality Management District](#), Alameda County [Healthy Homes Department](#), and the City of Berkeley [Toxics Management Division](#). Please select the option that is applicable to your project.

- ☐ This project does not involve disposal of universal or hazardous waste.
- ☐ This project includes disposal of universal or hazardous waste in a responsible, safe and verifiable manner.

Diversion Documentation

Green Halo tracking is required for all projects generating 100 pounds (or 55 gallons) of waste or more. Please select the option that is applicable to your project.

- ☐ A Construction Waste Management Plan has been submitted via Green Halo at www.berkeley.wastetracking.com. Prior to permit final, weight tickets for all materials disposed and recycled must be uploaded. Photos are acceptable for salvaged/reused materials.

Green Halo Tracking Number:

- ☐ A letter will be provided to the Building Inspector at the time of final inspection affirming that this project has produced less than 100 pounds (or 55 gallons) of waste, all waste was site-sorted, and any waste that could be recycled was recycled properly through a waste disposal service provider, either on-site or at the contractor's office/shop. (This option is subject to approval for the duration of the project.)

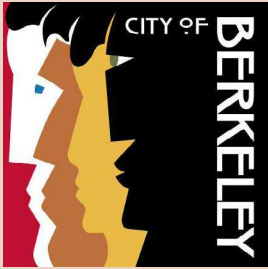
Acknowledgment

I understand the waste diversion requirements of Berkeley Municipal Code 19.37 and submit this Construction Waste Management Plan pursuant to California Green Building Standards Code 4.408.2 or 5.408.1.1.

Name

Signature

Date



**Building and Safety
Permit Service Center**

Where an application is made for construction as described in California Building Code (CBC) Chapter 17, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more approved agencies to perform inspections during construction on the types of work listed under CBC Section 1705. These inspections are in addition to the City of Berkeley inspections identified in CBC Section 110.

The registered design professional in responsible charge shall prepare the statement of special inspections in accordance with CBC Section 1704.3.1 for submittal by the applicant to the Building Official as a condition for permit issuance.

Building and Safety
1947 Center St. 3rd floor
Berkeley, CA 94704
510-981-7440 TTY 6903
buildingandsafety@berkeleyca.gov

SPECIAL INSPECTIONS

Project Information

Project Address:

Permit Number:

Contractor's Responsibility: Each contractor responsible for the construction of a main wind- or seismic- force resisting system or component listed in the statement of special inspections shall submit a statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's signature on this Statement of Special Inspection constitutes the statement of the responsibility and acknowledgement of awareness of the requirement for special inspections.

Special Inspector Qualifications: The special inspector shall provide written documentation to the Building Official demonstrating his or her competence and relevant experience or training. The registered design professional in responsible charge and engineer of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to act as the special inspector for the work designed by them, provided they qualify as special inspectors.

Special Inspection Agencies:

Agency: Inspections:

Agency: Inspections:

Agency: Inspections:

Acknowledgements:

Registered Design Professional in Responsible Charge:

Name	Signature	Date

Owner's Authorization:

Name	Signature	Date

Contractor:

Name	Signature	Date

Building Official's Acceptance:

Name	Signature	Date

SPECIAL INSPECTIONS

The **Registered Design Professional in Responsible Charge** shall indicate the applicability and frequency of special inspections by circling either C for continuous or P for periodic inspections for the required types of work.

Type of Work	Frequency (circle one)		Specific Test Procedures
Special Cases (CBC 1705.1.1):			
Epoxy or Mechanical Anchors	C	P	
Moisture Barriers	C	P	
Green Roofs	C	P	
Other:	C	P	
Concrete Construction (CBC 1705.3)	C	P	
Masonry Construction (CBC 1705.4)	C	P	
Wood Construction (CBC 1705.5)	C	P	
Steel Construction:			
Structural Steel (CBC 1705.2.1)	C	P	
Cold Formed Steel (CBC 1705.2.2-1705.2.4)	C	P	
Seismic Resistance (CBC 1705.12 & 1705.13)	C	P	
Wind Resistance (CBC 1705.11)	C	P	
Retrofit of Unreinforced Masonry Buildings	C	P	
Exterior Insulation and Finish Systems (CBC 1705.16)	C	P	
Fire Resistive Construction:			
Spray Applied Materials (CBC 1705.14)	C	P	
Mastic and Intumescent Coatings (CBC 1705.15)	C	P	
Penetrations and Joints (CBC 1705.17)	C	P	
Smoke Control (CBC 1705.18)	C	P	
Deep Foundations:			
Driven Piles (CBC 1705.7)	C	P	
Cast-in-Place Piers (CBC 1705.8)	C	P	
Helical Piles (CBC 1705.9)	C	P	
Soils (CBC 1705.6)	C	P	

GENERAL NOTES

- NOT ALL MECHANICAL AND ELECTRICAL ITEMS AT CEILING ARE SHOWN. SEE MECHANICAL AND ELECTRICAL DRAWINGS.
- TYP. CEILING HEIGHTS:
1. SUSPENDED CLGS. 8'-0" U.N.O.
2. GYP. BD. CLGS. 9'-0" U.N.O.
3. METAL SECURITY CLGS. 8'-2" U.N.O.

SHEET NOTES

- PROVIDE 2-HR HORIZONTAL DUCT SHAFT AROUND MECHANICAL DUCT. FOR MECHANICAL INFORMATION, SEE MECHANICAL DRAWINGS AND FOR DUCT SHAFT DETAILS, SEE 21/AB.01.
- ALL METAL SECURITY CEILINGS SHOULD BE PERFORATED (W/ AC MATERIAL), EXCEPT @ SHOWERS-WEIGH SHALL BE UNPERFORATED.
- WARNING KITCHEN #1149 SHALL HAVE WASHABLE AC TILE CEILING.

S. J. AMOROSO
CONSTRUCTION COMPANY, INC.
348 Hatch Drive
Foster City, CA 94404
TEL (650) 349-6691
FAX (650) 349-7031

CONSULTANT:
Del Campo & Maru
Architects/Planners/Engineers
45 Lonsing Street
San Francisco, California 94105
(415) 777-4025
FAX (415) 896-1691

REVISIONS:		
ISSUE	DESCRIPTION	DATE
1	100% CD	07/27/98
2	PERMIT SET	09/01/98
3A	ADDENDUM #1	10/01/98
3B	ADDENDUM #2	11/02/98
3	CONFORMED DOCUMENTS	12/21/98
3A	CONFORMED DOCUMENTS ADDENDUM #1	02/04/99

BERKELEY PUBLIC SAFETY BUILDING
CITY OF BERKELEY, CALIFORNIA
KEY PLAN:

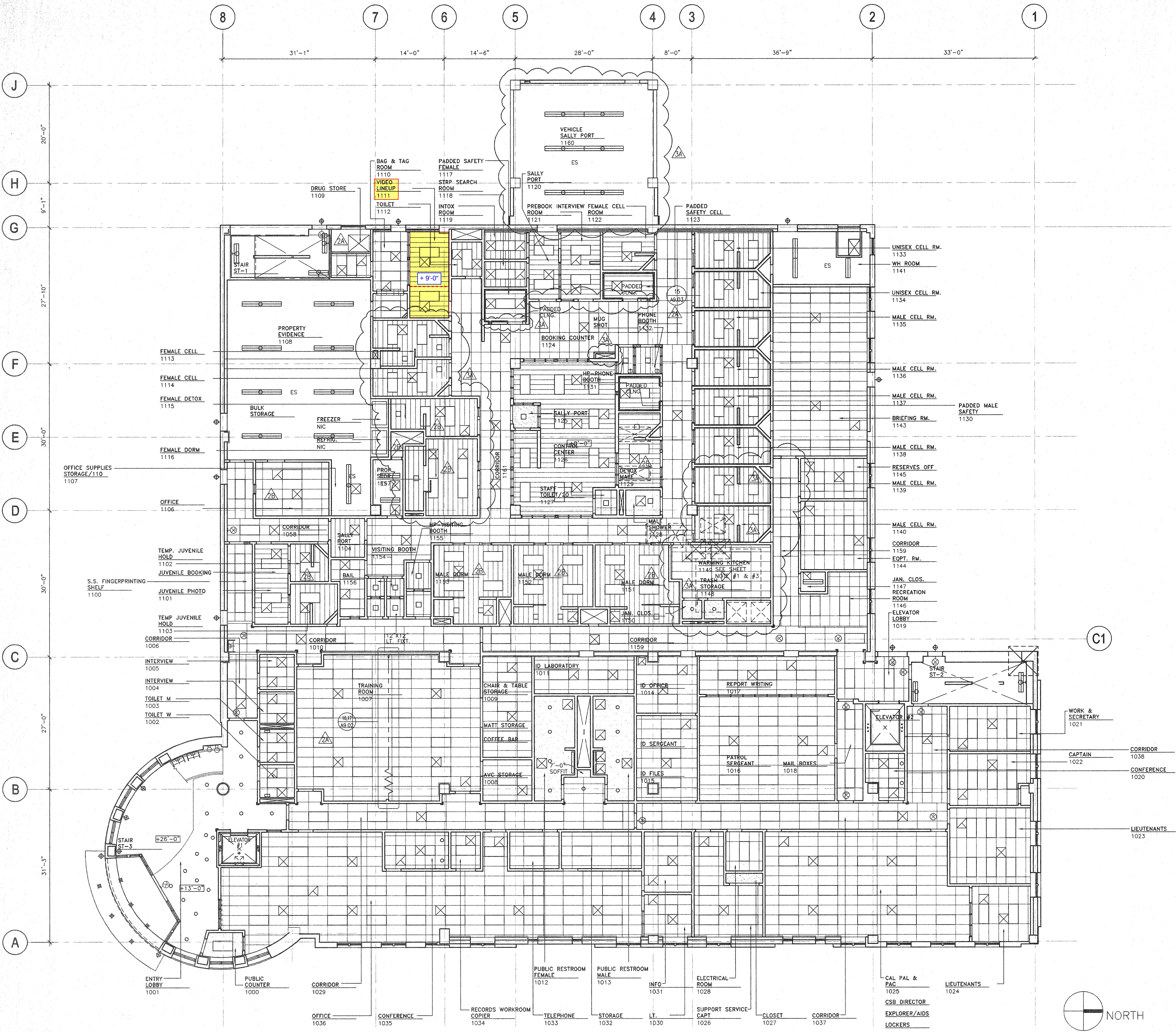
DRAWN BY: TEAM
CHECKED BY: BF
SCALE: 1/8"=1'-0"

SHEET TITLE
FIRST FLOOR REFLECTED CEILING PLAN

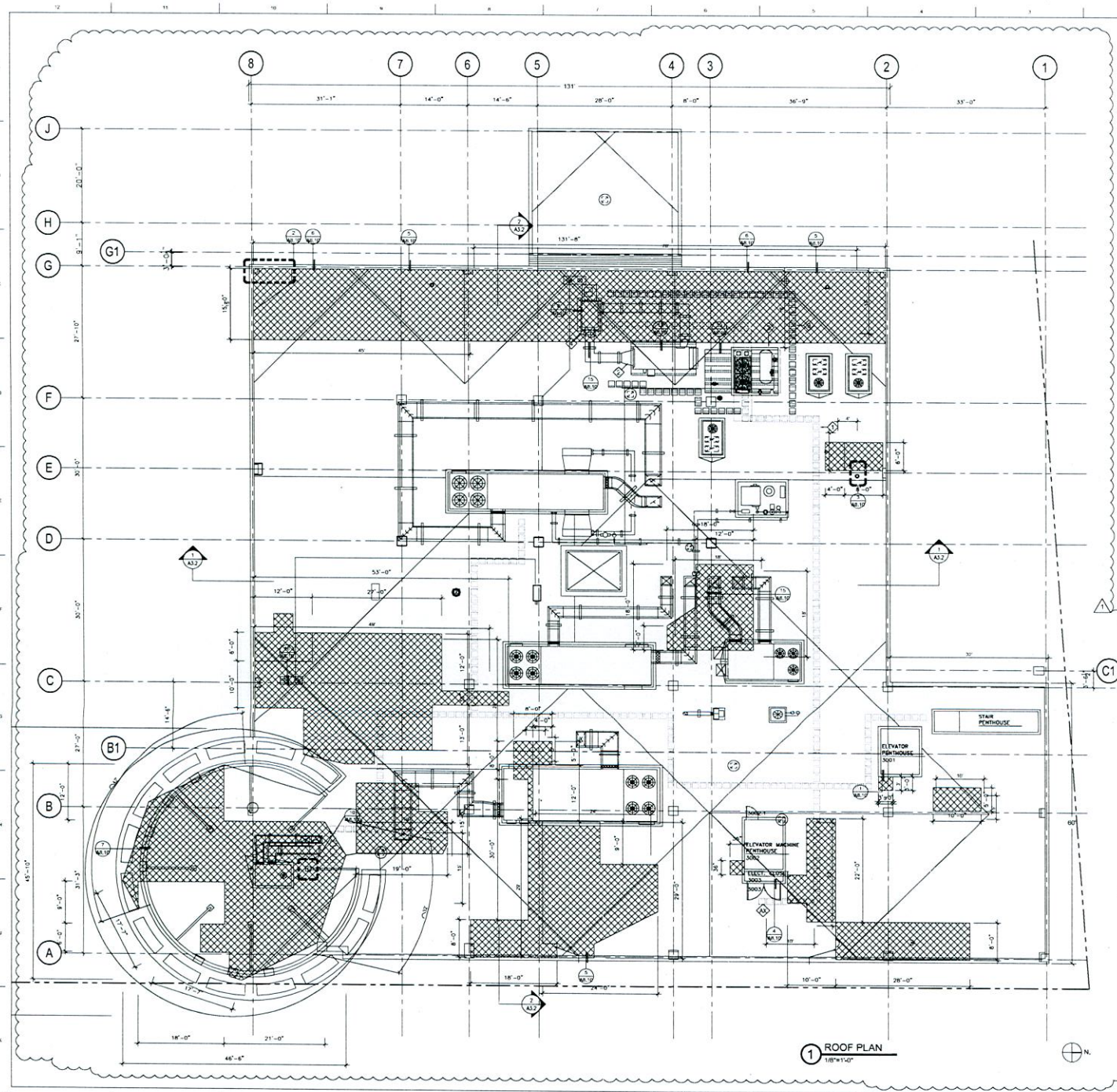
SHEET NO.
A4.02
PROJECT NO. 98003

CEILING SYMBOL LEGENDS

- EXPOSED STRUCTURE
- LT.
- 24"x48" SUSP. CLG.
- LT.
- 24"x24" SUSP. CLG.
- LT.
- METAL SECURITY CLG. SEE NOTE 2 ABOVE
- LT.
- GYP. BD. CLG.
- LT.
- 12" X 12" SURFACE MTD. AC TILE
- DIFFUSERS
- EXPOSED
- 12" X 12" RECESSED LT. FIXTURE



1 FIRST FLOOR REFLECTED CEILING PLAN
SCALE 1/8"=1'-0"



GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL FLATWORK SLOPES 2 PER FOOT MIN. TO DRAIN.
2. CRACKET PLUMBER PANTS ALSO NEEDED TO (E) ROOF DRAIN SYSTEM AT 1/4 PER FOOT MIN.
3. DETAILS PROVIDED ON ALL ARE FOR CONTRACTOR REFERENCE ONLY. CONTRACTOR TO NOTIFY OWNER IF ANY ADDITIONAL CHANGES REQUIRED. ADDITIONAL CHANGES REQUIRED. ADDITIONAL CHANGES REQUIRED.
4. ROOFING DRAIN TO BE COORDINATED WITH PDR ROOFING PROJECT.

KEY NOTES:

- ◆ (E) ROOFING WALK PADS
- ◆ (H) HVAC SYSTEM DRAIN
- ◆ (H) ROOFING WALK PADS COORDINATE WITH ROOFING PROJECT
- ◆ (H) HVAC SYSTEM TO BE REMOVED (SME)

LEGEND:

- SCHEME OF HVAC PADS: 1/4 INCH WORK (H.A.C.)
- SCHEME OF ROOFING WORK: 1/4 INCH WORK (H.A.C.)
- TO BE USED AS A SEPARATE PROJECT BUT TO BE COORDINATED CONCURRENTLY WITH THE DATA CENTER UPGRADE.

ANGUS-HAMER
Networking
4400 Auburn Boulevard, Ste. 110
Sacramento, Ca. 95841
Phone: 916.779-2900
www.angushamer.com

CITY OF BERKELEY
DEPARTMENT OF PUBLIC WORKS

PUBLIC SAFETY BUILDING

**DATA CENTER
UPGRADE
ROOF REPAIRS**

	ADDENDA #1	4-25-13
	APP. # 2	4/30/13
REV	REVISION DESCRIPTION	DATE

KAPPE+DU ARCHITECTS



801 D STREET SAN RAFAEL CA 94901
TEL: 415.457.7801 FAX: 415.457.7885

ARCHITECT / ENGINEER APPROVAL:

DESCRIPTION:

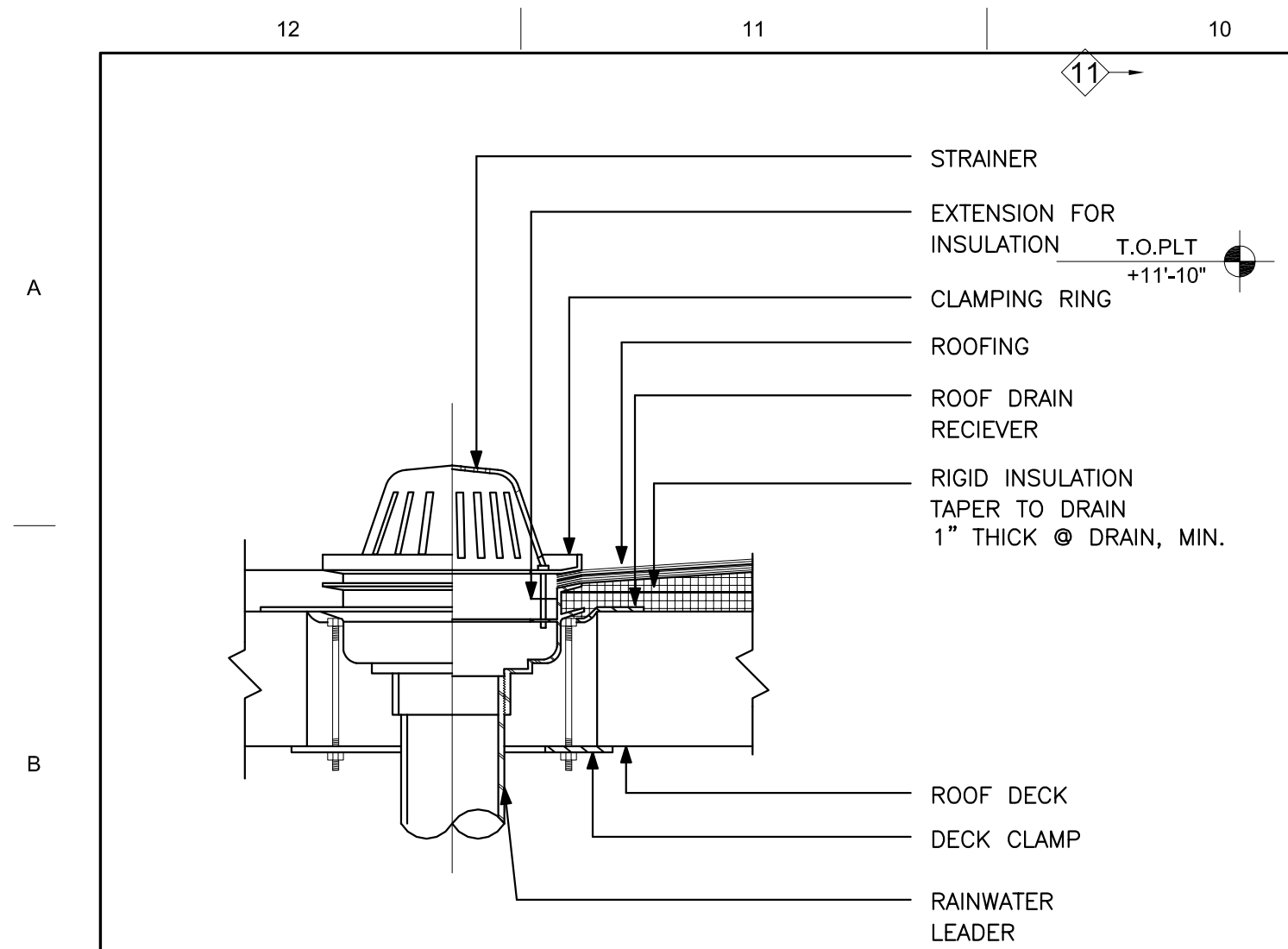
ROOF PLAN

PROJECT NO: 0913
DATE: 4-25-13

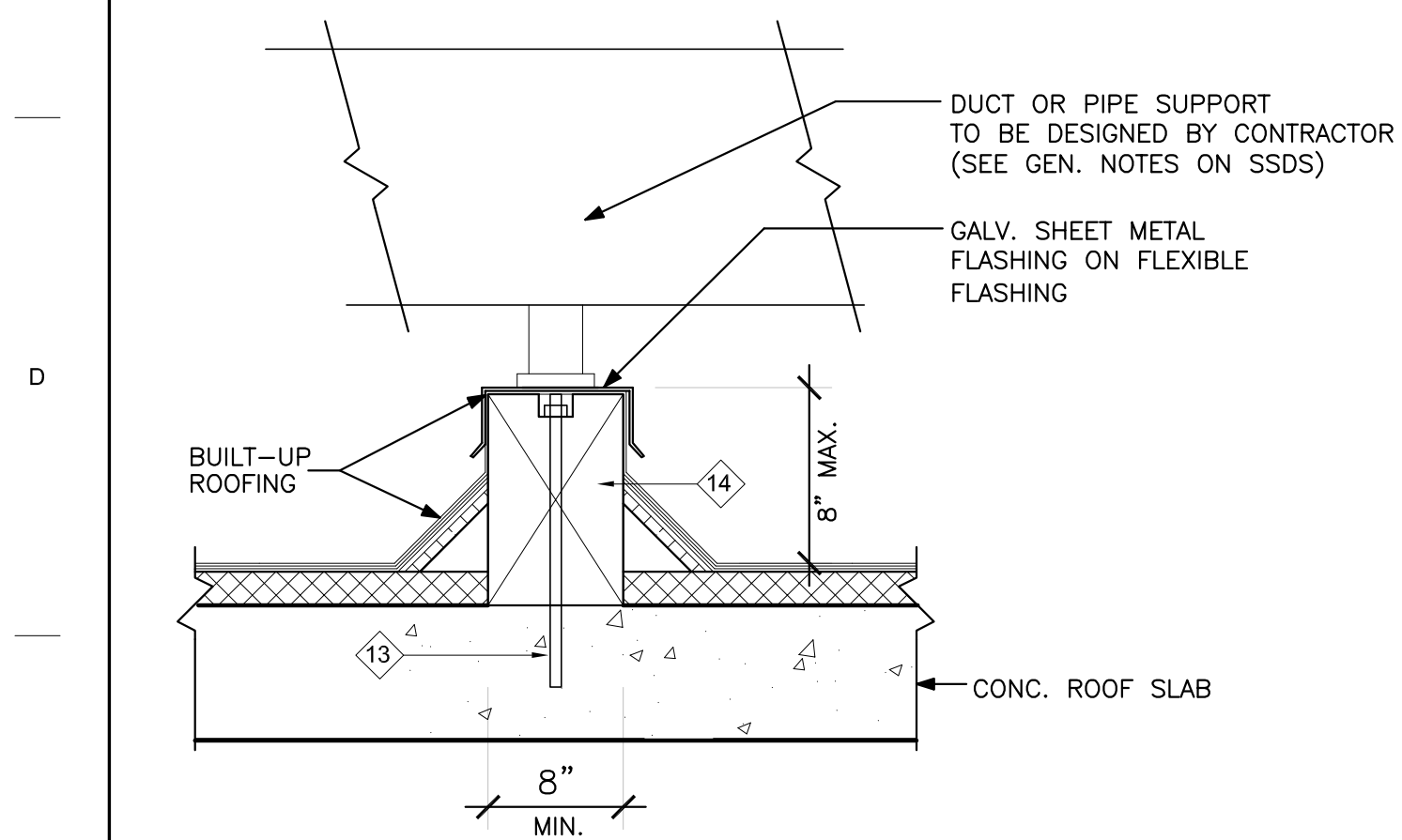
SHEET NO:
PSB
A2.30

ADDENDA #1

13-10751-C
2

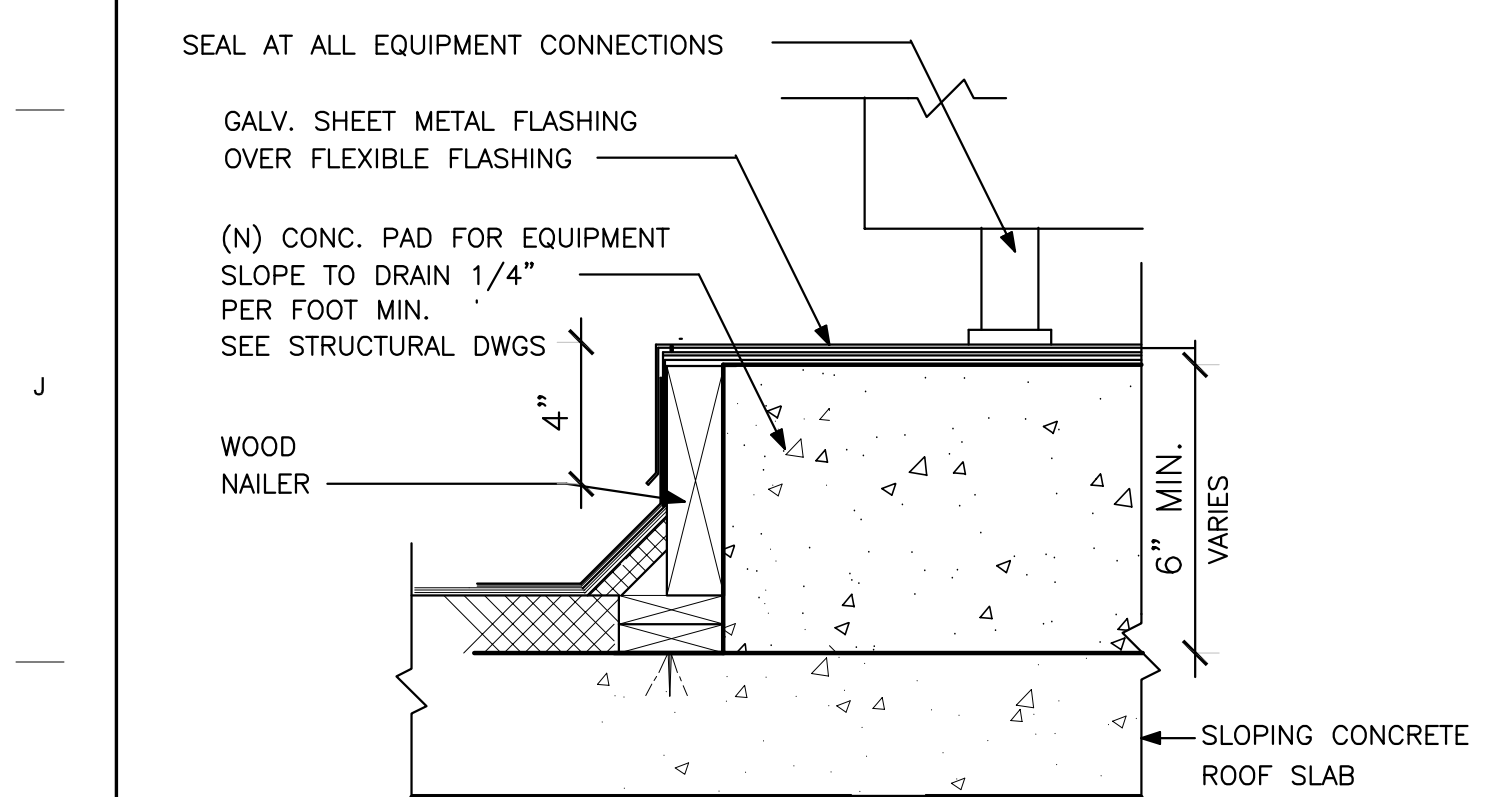


16 ROOF DRAIN, TYP.
1 1/2" = 1'-0"

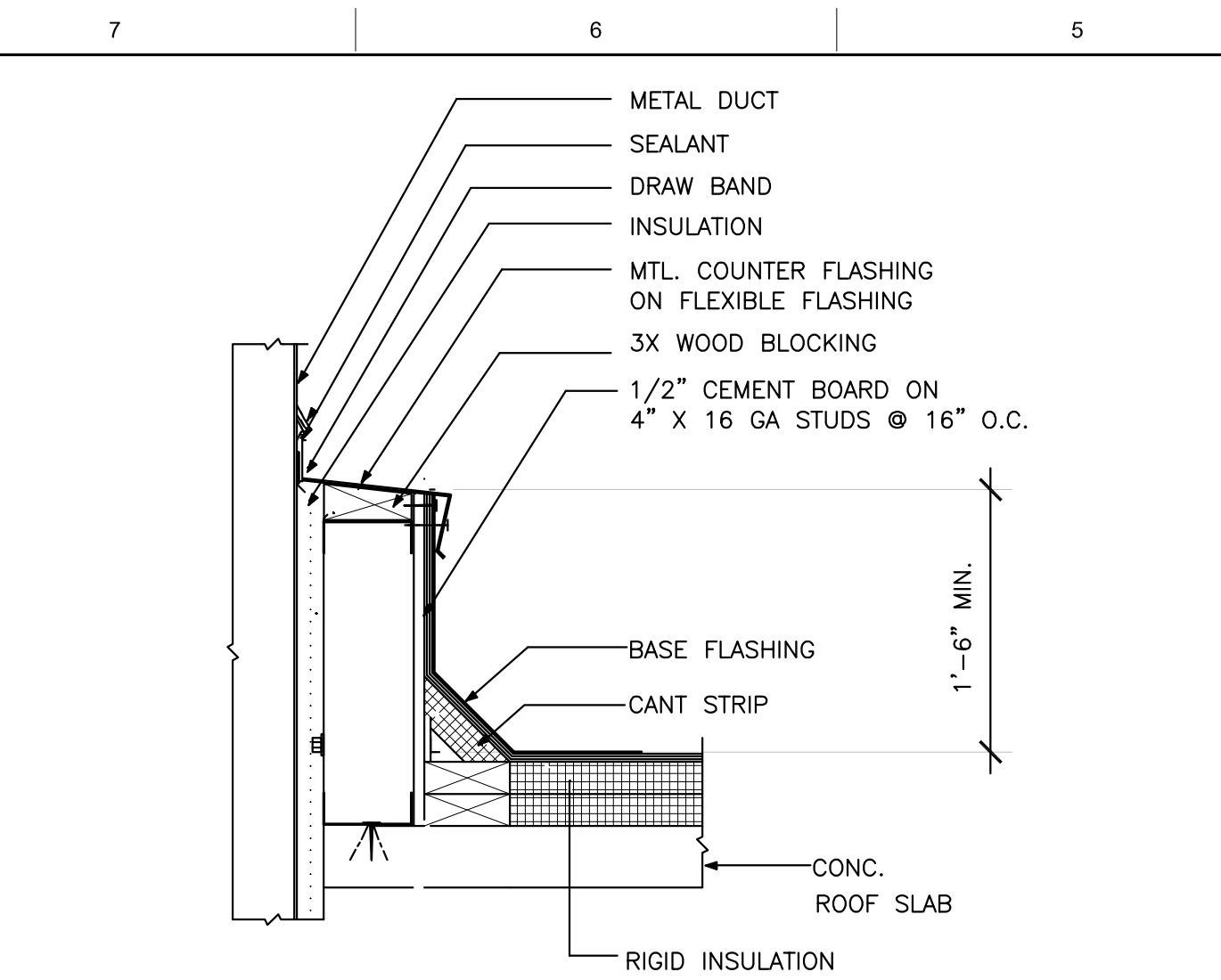


15 MECH. EQUIP SLEEPER, TYP.
1 1/2"=1'-0"

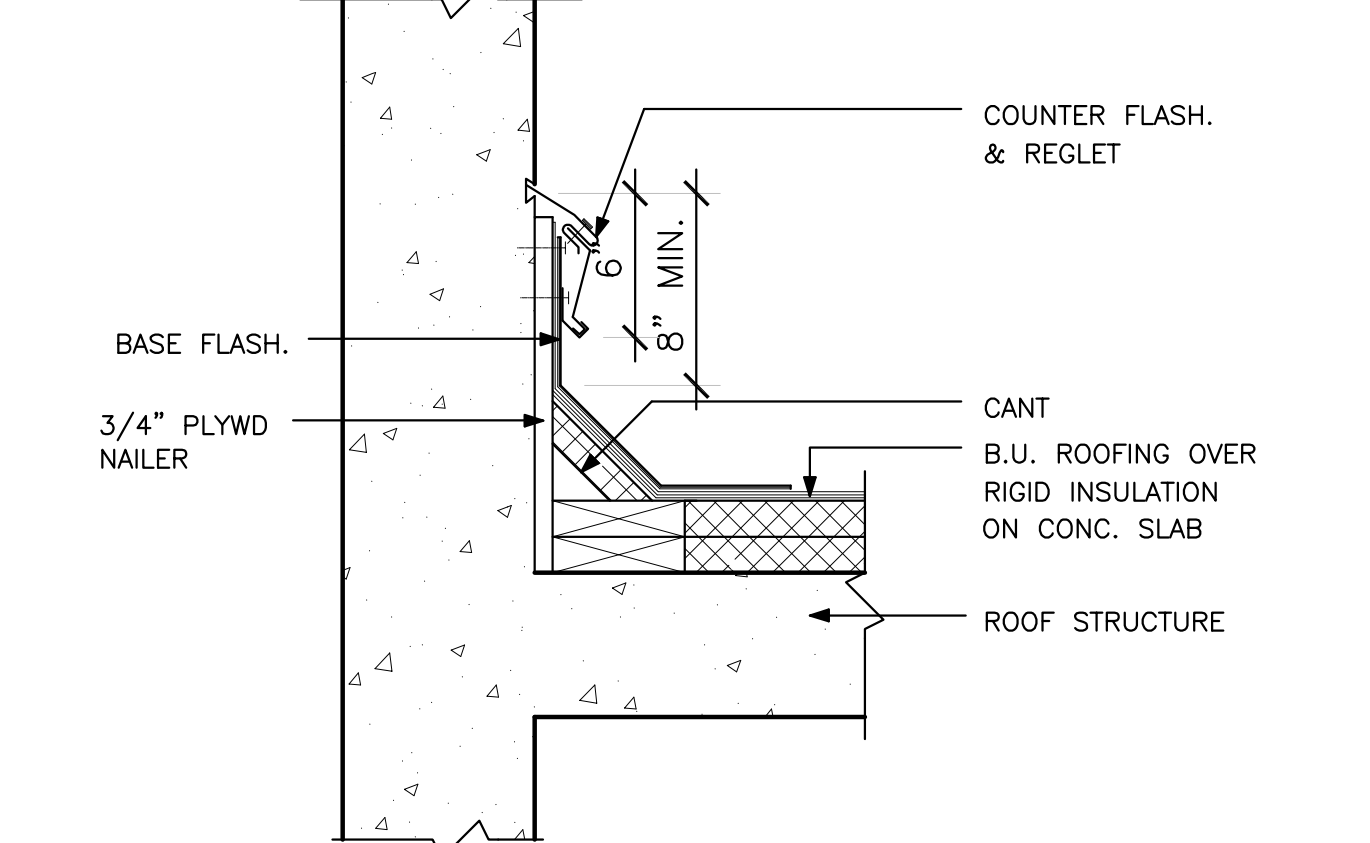
10	ALPHAGUARD MT PARAPET KICKER PENETRATION
	N.T.S.



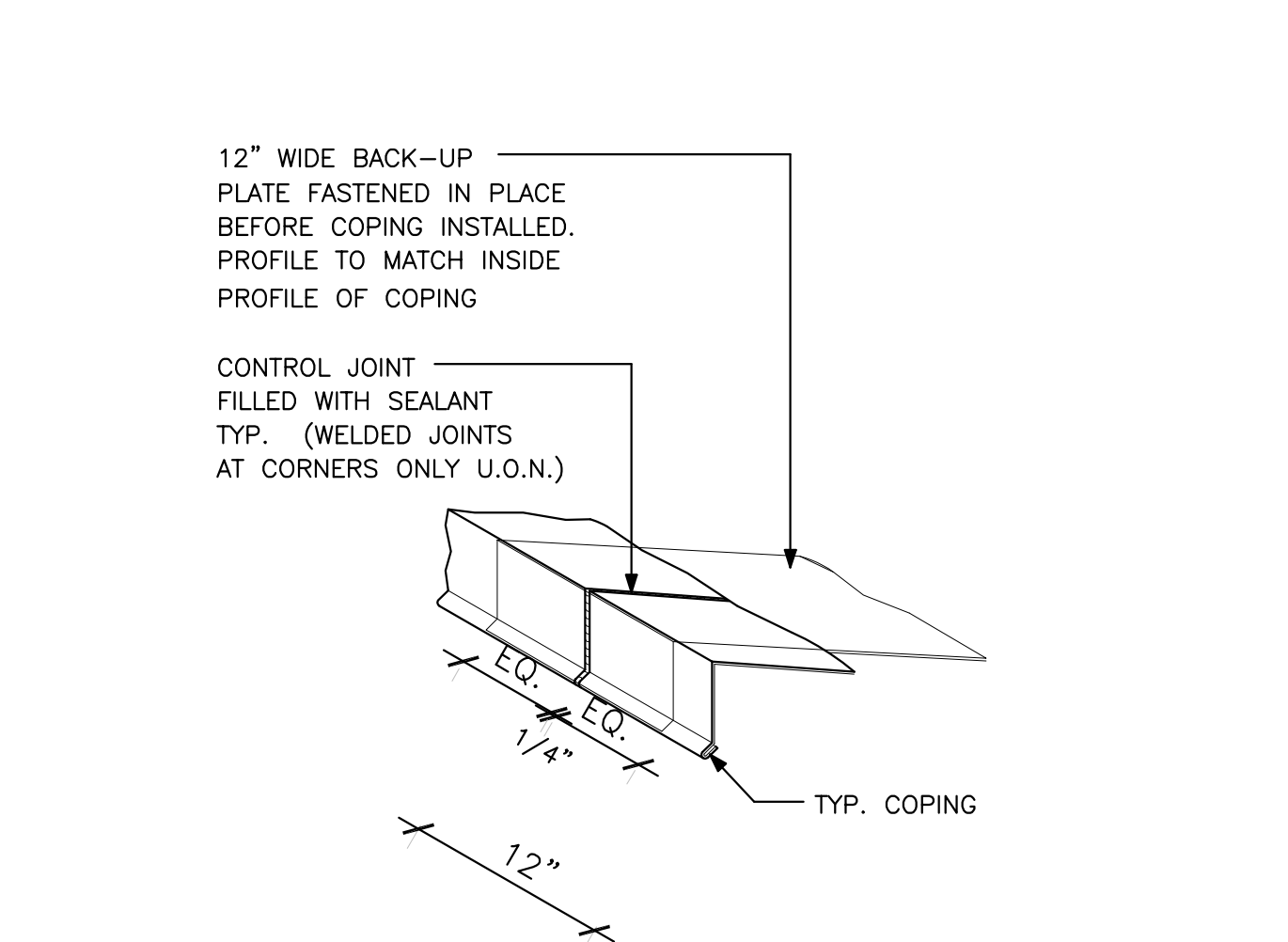
13 RAISED SLAB AT HVAC EQUIPMENT, TYP.
1 1/2"=1'-0"



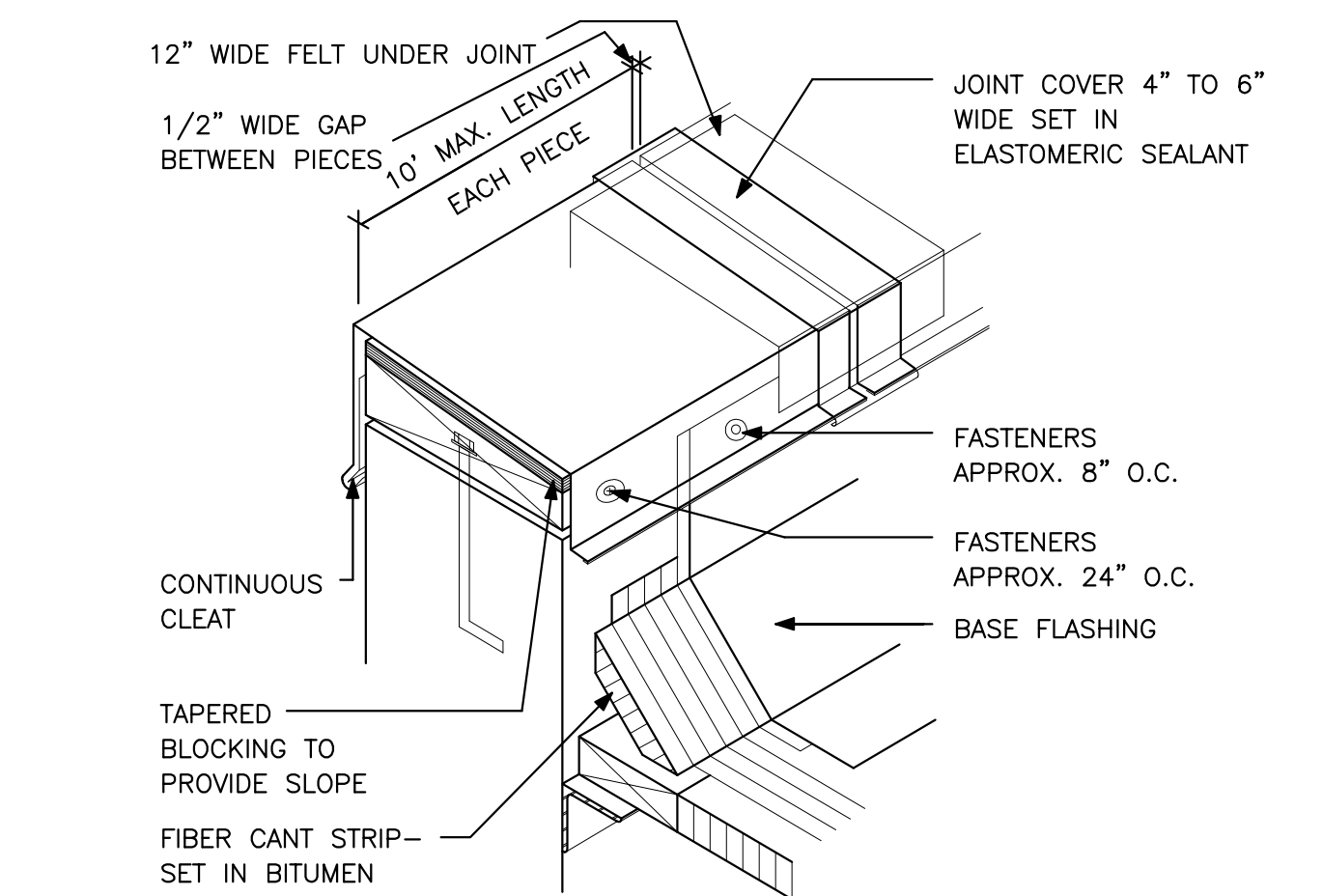
8 DUCT AT ROOF PENETRATION



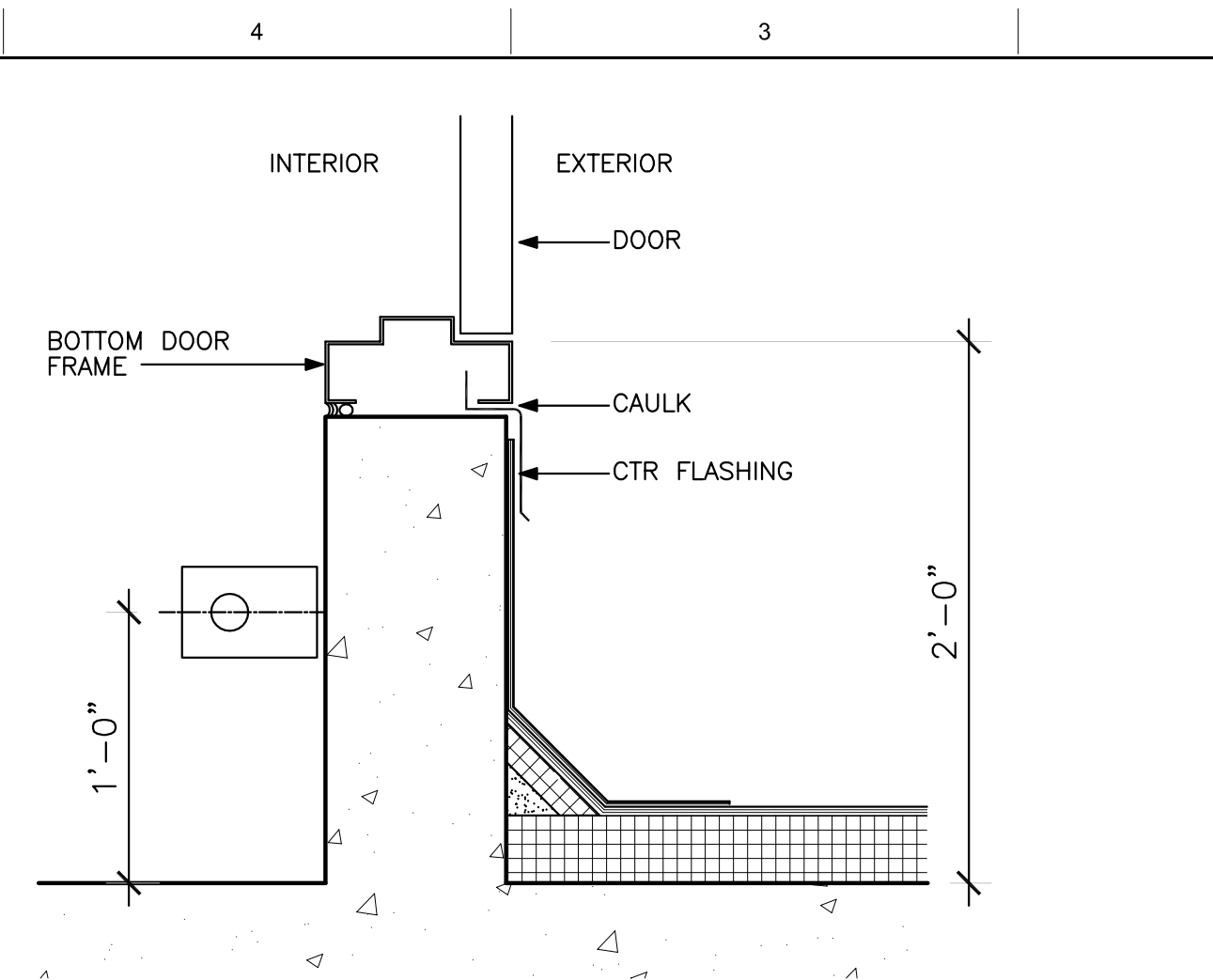
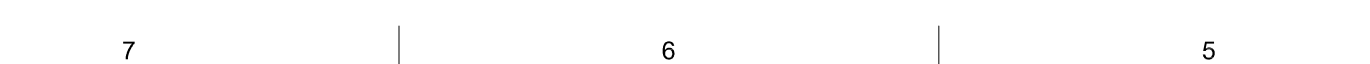
7 CANT FLASHING AT PARAPET, TYP.
1 1/2" = 1'-0"



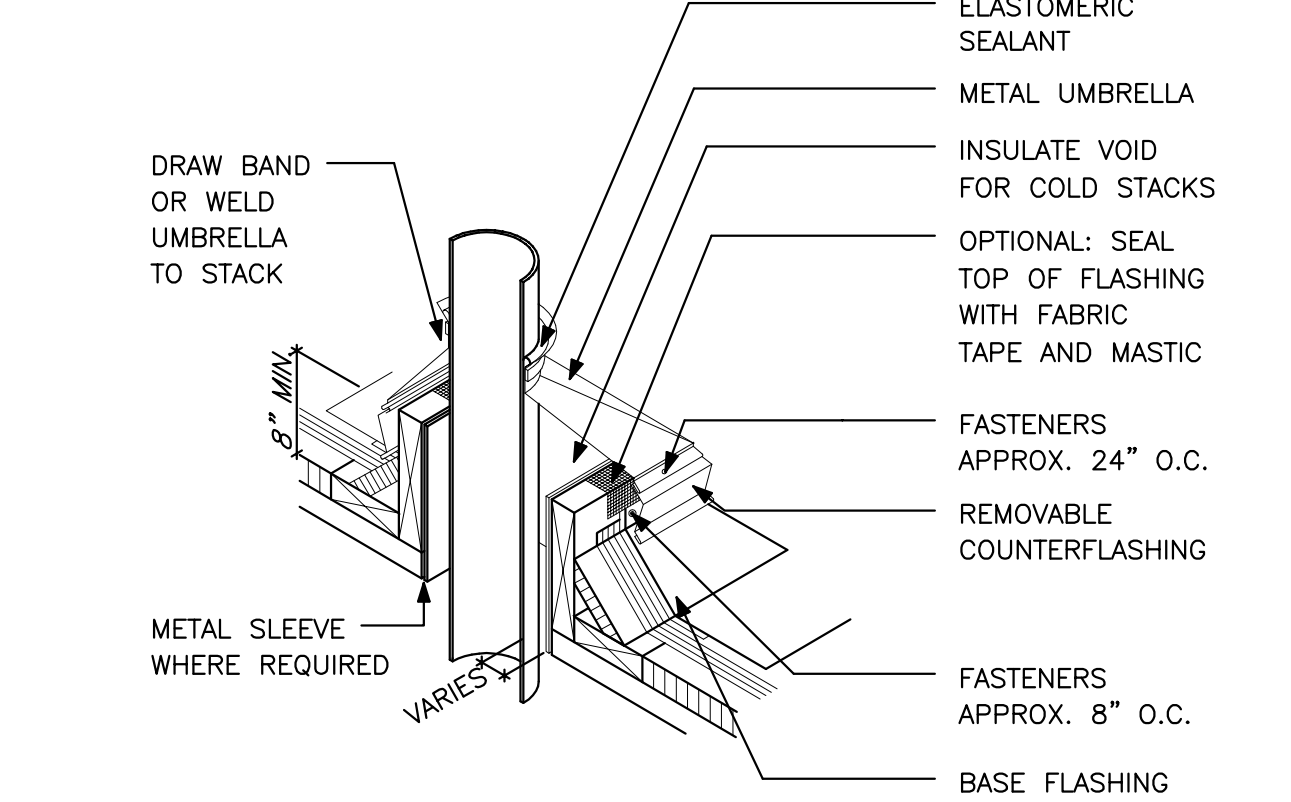
6 COPING CONTROL JOINT, TYP.
N.T.S.



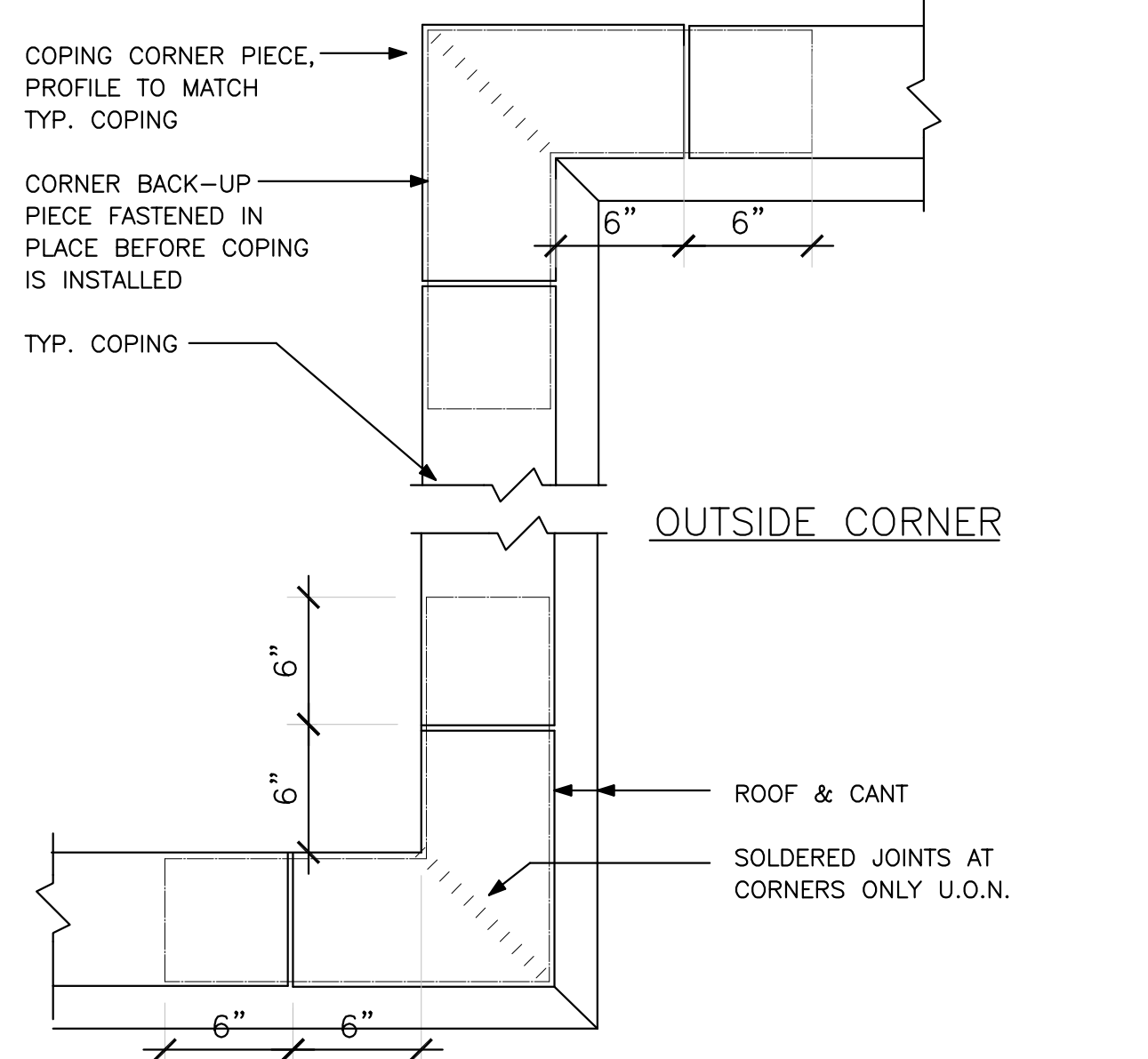
5 PARAPET & CANT FLASHING, TYP.
1 1/2"=1'-0"



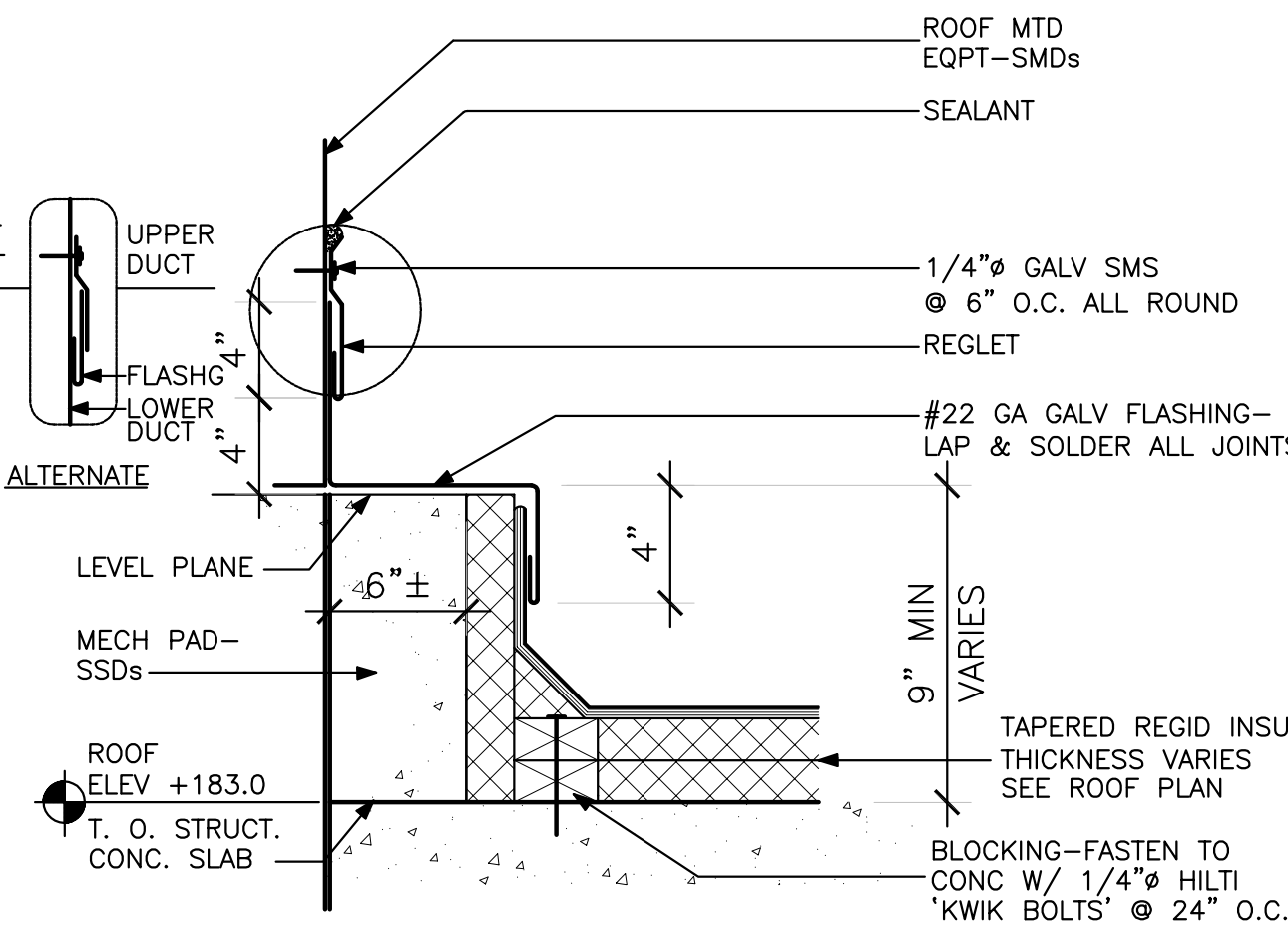
4 DOOR SILL AT PENTHOUSE CURB
1 1/2"=1'-0"



3 PIPE PENETRATION, TYP.
1 1/2"=1'-0"



2 COPING AT CORNERS, TYP.
1 1/2"=1'-0"



1 PENTHOUSE CURB FLASHING
1 1/2"=1'-0"



GENERAL NOTES:

1. BUILT-UP ROOFING TO BE TAPERED AT 1/4" PER FOOT MIN. AND SLOPED TO SCUPPERS AND DOWNSPOOTS.
2. CONTRACTOR TO DESIGN WATERPROOFING FOR ROOFTOP HVAC & PIPING SUPPORTS.
3. ROOFING DETAILS ARE FOR ANTICIPATED CONDITIONS AND FOR CONTRACTOR REFERENCE. ADDITIONAL CONDITIONS MAY OCCUR UPON DISCOVERY.

KEY NOTES:

- 1 REFLECTIVE MYLAR ADHESIVE w/ MIRROR SIDE TO GLASS
- 2 BATT INSULATION w/ FOIL TO PLY WD. INSIDE
- 3 MTL. STUDS
- 4 1/2" PLY WD., PAINTED TO MATCH (E) WALLS
- 5 RIGID INSULATION
- 6 AIR GAP
- 7 SILICONE SEALANT AT GLASS
- 8 CONDENSATE TRAY AND FLASHING TO BE PAINTED ON THE OUTSIDE OF TRAY.
- 9 CONDENSATE WEEP HOLE
- 10 (E) WALL w/ PAINTED GYP.
- 11 (E) ACOUSTIC CEILING, PATCH AND REPAIR AS NEEDED.
- 12 (E) FIN. WD. WINDOW SILL
- 13 2" Ø EPOXY ANCHOR w/ 6" EMBEDMENT, AT 12" O.C. MAX & 4" MIN. 6" MAX. FROM ENDS. (3) ANCHORS MIN. AT A SLEEPER. (SEE STRUCTURAL GENERAL NOTES FOR THE MATERIALS.)
- 14 2x PRESSURE TREATED WD. SLEEPER & FRAMING w/ 1" Ø 1 x 1" DEEP HOLE AT ANCHOR TYP. 4" O.C. MAX. (TO BE COORDINATED WITH HVAC CONTRACTOR.)
- 15 REMOVE ALL RUST OR LOOSE DEBRIS BEFORE APPLYING ALPHAGUARD MT. PRIME METAL STACK WITH M PRIME.
- 16 ALPHAGUARD MT. FLASHING FULLY ADHERED TO PROPERLY PREPARED SURFACE.
- 17 ALPHAGUARD MT. ROOFING MEMBRANE
- 18 CONCRETE DECK PRIMED WITH POLY/ROOF C PRIME.

LEGEND:

AH ANGUS-HAMER
Networking
4400 Auburn Boulevard, Ste. 110
Sacramento, Ca. 95841
Phone: 916.779-2900
www.angushamer.com

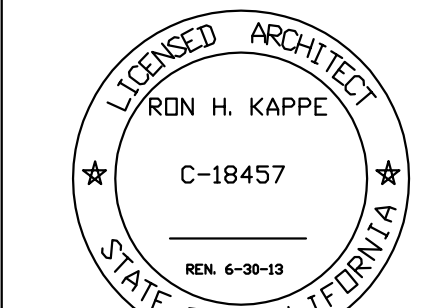
CITY OF BERKELEY
DEPARTMENT OF PUBLIC WORKS

PUBLIC SAFETY BUILDING

DATA CENTER UPGRADE

REV	REVISION DESCRIPTION	DATE

KAPPE+DU ARCHITECTS



801 'D' STREET SAN RAFAEL, CA 94901
TEL: 415.457.7801 FAX: 415.457.7885

ARCHITECT / ENGINEER APPROVAL

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DESCRIPTION:

BUILDING DETAILS

PROJECT NO: 0913

DATE: 4-2-13 COB 13-10751-C

SHEET NO:

PSB
A8.10

BID SET

DOCUMENT 00900

ADDENDUM #2

1. Public Safety Building Sheet A2.30 Legend revision, see attached.
2. Changes to Specifications:
 1. Specification Section 07511– Roof and Flashing Restoration with Title 24/Cool Roof Surfacing for Public Safety Building PART 2 PRODUCTS 2.4 Auxiliary Roofing Membrane Materials add Section F:
Cool roof coating: high solid, water based, heavy duty coating formulated with nanotechnology-engineered blend of acrylic latex polymers.

Density: 6.8 lbs /gal

Reflectance: 83.2 %

Emissivity: 0.83

SRI: 103

Percent solids: 59% [by weight] and 65% [by volume]

2.08 WALKWAYS

- A. Walkway pads, ceramic-granule-surfaced reinforced asphaltic composition slip-resisting pads, manufactured as a traffic pad for foot traffic, 1/2-inch (13 mm) thick minimum.
 1. Basis of design product: Tremco, Trem-Tred, or equal.
 2. Flexural Strength at max. load, minimum, ASTM C 203: 210 psi (1.5 kPa).
 3. Granule adhesion (weight loss), maximum, ASTM D 4977: 1.1 gram.
 4. Impact Resistance at 77 deg. F (25 deg. C), ASTM D 3746: No Damage to Roof.
 5. Pad Size: 36 by 48 inch (914 by 1220 mm).
 6. Provide shop drawing indicating walkway pad layout for access to roof-top equipment from line "D" to equipment enclosure.

END OF DOCUMENT

SECTION 07511 – ROOF AND FLASHING RESTORATION WITH TITLE 24 / COOL ROOF SURFACING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 specifications, apply to this section

SUMMARY:

- A. This Section includes the following scope of work for the Public Safety Building and Civic Center Building:
 - 1. Remove and replace all wet/damaged insulation as outlined in paint.
 - 2. Furnish and install new multi ply, cold applied built up roof membrane in all replacement areas.
 - 3. New flashings on penetrations, projects and vent stacks.
 - 4. Details specific to this project.
 - 5. Installation of Title 24 /CRRC approved surfacing.
 - 6. Miscellaneous work as directed.
- B. Related Sections include the following:
 - 1. Division 7 Section "Sheet Metal Flashing and Trim"

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. Fire/Windstorm Classification: Class 1A-60.
 - 2. U.L. Class A fire rating
- D. Flashings: Comply with requirements of Division 7 Section "Sheet Metal Flashing and Trim." Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations of the following:
 - 1. FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings.
 - 2. FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.

3. NRCA Roofing and Waterproofing Manual (Fifth Edition) for construction details.
4. SMACNA Architectural Sheet Metal Manual (Fifth Edition) for construction details.

- E. Cool roof coating /products: All products submitted for use on this project must be listed in the current CRRC guide.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
 1. Base, perimeter, and detail flashings, cants, and membrane terminations.
 2. Crickets, saddles, and tapered edge strips, including slopes.
- C. Samples for Verification: For the following products:
 1. 12-by-12-inch square of base sheet.
 2. 12-by-12-inch square of ply sheet.
 3. 12-by-12-inch square of finishing sheet.
 4. Applied sample of Cool roof coating
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of meeting performance requirements.
- F. Qualification Data: For Installer, manufacturer, and manufacturer's technical representative.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- H. Maintenance Data and Training Materials: For roofing system to include in maintenance manuals and Owner's training library.
- I. Warranties: Special warranties and service agreements specified in this Section.
- J. Manufacturer Approval of Testing Agency: Manufacturer's letter indicating acceptance of qualifications of testing agency to perform inspections specified under Part 3 Article "Field Quality Control," including manufacturer's compliance with testing agency's requirements for final roofing inspection and manufacturer's warranty certification.
- K. Inspection Reports: Copy of daily and final technical inspection reports of roofing installation.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer that has UL listing and FMG approval for roofing system identical to that used for this Project.

1. Manufacturer's Technical Representative Qualifications: An individual experienced in the installation and maintenance of the specified roofing system and qualified to determine Installer's compliance with the requirements of this section.
 - C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
 - D. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.
 - E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency. Fire rating: U.L. Class A.
 - F. Pre-installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing, flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 6. Review governing regulations and requirements for insurance and certificates if applicable.
 7. Review temporary protection requirements for roofing system during and after installation.
 8. Review roof observation and repair procedures after roofing installation.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
 - B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturers written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard warranty form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified roof restoration warranty period. Failure includes roof leaks.
 - 1. Special warranty includes roofing membrane, baseflashings, roofing membrane accessories, roof insulation, fasteners, cover boards, substrate board, and other components of roofing system, whether manufactured by or approved by the manufacturer for 10 [Ten] years, for roof restoration from date of Substantial Completion.
- B. Maintenance Service Agreement: Manufacturer's standard form, in which manufacturer agrees to provide the following service for the roof system during the second, fifth and tenth year of the warranty period specified above:
 - 1. Inspection of the roof membrane and associated roofing system components listed above by a manufacturer's technical service representative.
 - 2. Report of inspection documenting roofing conditions.
 - 3. Routine preventive maintenance and repairs to damage to the roof system, excluding such damage to the roof system excluded from the warranty and service agreements as a result of neglect, negligence, vandalism or other excluded cause as described in manufacturer's published terms and conditions at the date of this contract.
 - 4. General rooftop housekeeping and cleanup, subject to limits, but generally including removal of incidental debris.
 - 5. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period: years from date of Substantial Completion.
- C. Special project warranty: Submit roofing installers warranty, on warranty form at end of this section, signed by installer, covering work of this section, including all components of the membrane roofing system such as membrane, baseflashing, roof insulation, fasteners, walkway products, for the following warranty period:
 - 1. Warranty period: Two [2] years from date of substantial completion

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Product requirements in this section are based upon products named in other Part 2 articles. Subject to compliance with requirements, provide the named product or an approved comparable product by one of the following:
 - 1. Cold-Process Built-up Asphalt Roofing with Energy Star/Cool roof surfacing by Tremco is the basis of design.
 - 2. Kemper, Texas Refineries or equal.

2.2 BASE-SHEET/ FINISHING SHEET MATERIALS

- A. Base Sheet: SBS Modified Asphalt-coated polyester/glass fiber/polyester laminated ply sheet, complying with ASTM D 5147, with the following minimum properties:
 - 1. Tensile Strength per ASTM D 5147: 300 lb/in
 - 2. Tear Strength, per ASTM D 5147: 500 lbf MD
 - 3. Tear Strength, per ASTM D5147: 500 lbf XMD
- B. ROOFING MEMBRANE PLIES: /BACKER SHEET Asphalt-coated fiberglass ply sheet, complying with ASTM D 4601, with the following minimum properties:
 - 1. Breaking Strength : per ASTM D 146-78: 135 lbf/in MD and 130 lbf/in XMD
 - 2. Weight : 31.0 lb/100 meeting ASTM D 228
 - 3. Thickness: 55 mils meeting ASTM D 146
- C. FINISHING SHEET/BASEFLASHING SHEET: SBS granulated polyester/glass fiber/polyester laminated modified bitumen finishing sheet, complying with the following minimum properties:
 - 1. Breaking Strength: per ASTM D5147 160lbf.in MD and 160 lbf/in XMD

2.3 FLASHING MATERIALS

- A. Reinforcing ply: Non shrinking, non rotting, vinyl coated woven glass mesh.

2.4 ASPHALT MATERIALS

- A. Water based Primer: ASTM D 41. Tremprime WB
- B. Cold-Applied Adhesive: Roofing system manufacturer's asphalt-based, 1-part asbestos-free, cold-applied adhesive specially formulated for compatibility and use with modified bitumen membranes. Provide adhesive in containers labeled with UL and FMG logos indicating material was manufactured under UL and FMG quality assurance programs.

2.4 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to

substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

- D. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."
- E. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.5 INSULATION/ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation adhesive: Low rise foam, fast setting, high performance adhesive.
- D. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- E. Fiberboard insulation: ASTM C 208 Type II, grade 1, wood fiber, asphalt impregnated, chemically treated for deterioration. Thickness : ½ inch. Temple Inland or equal
- F. Isocyanurate Insulation: ASTM 1289, Type II, Class 1, Grade 2, closed cell isocyanurate foam core laminated on both sides, fiber reinforced, non asphaltic facer. Thickness: As needed to replace existing.

EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 - 4. Verify that concrete substrate is visibly dry and free of moisture.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Spud off all existing aggregate from membrane. Do not damage membrane.
- D. Remove all wet insulation and roofing in areas as designated by paint outline on roof

- E. Ponding areas [e] graveled areas] Over a prepared surface, furnish and install "Pond Patch" leveling compound. Contractor to fill "low areas" and contour material to provide positive slope to drain and eliminate ponding areas. Furnish and install rubberized over entire area at the rate of four [4] gallons per 100 square feet. Embed polyester reinforcement ply and broom in with no wrinkles or voids. Overlap sides and ends a minimum of four [4] inches. Apply second application of rubberized emulsion at the same rate. Contractor to check area with stringline or level to ensure the deflected area has been adequately raised to promote positive drainage from that location.
- F. Blisters/ridging: Spud flat all blisters and ridging. Replace ply for ply of materials removed.

3.3 INSULATION INSTALLTION

- A. Coordinate installing the roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday
- B. Comply with roofing manufactures written instructions for installing roof insulation.
- C. Adhere insulation: Install each layer of insulation and secure first layer of insulation to deck using low rise foam specifically designed for fastening specified board –type roof insulation to deck.
 - 1. Adhere first layer of insulation according to FMG's Approval guide for specified Windstorm Resistance.
 - 2. Fasten first layer to resist uplift at corners, perimeter and field.
 - 3. Adhere second layer, with low rise foam as directed. Stagger joints with no height elevation between boards of 1/8th inch.

3.4 ROOFING – GENERAL REQUIREMENTS

- A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."
- B. Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing built-up roofing system.
- D. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. Cold Process Asphalt Heating
 - 1. An in-line heat exchange unit may be used to facilitate application
 - a. Do not exceed maximum adhesive temperature of 100° F.
 - 2. Heat exchange unit: Use heat transfer oil approved by heating equipment manufacturer.
 - 3. Follow operation procedures recommended by heating equipment manufacturer.

- F. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 ROOFING MEMBRANE -REPLACEMENT AREAS / MEMBRANE SURFACING

- A. Install one lapped course of base sheet, extending sheet over onto existing membrane a minimum of eighteen [18] inches. Adhere base sheet as follows:
 - 1. Set base sheet in cold adhesive @ the rate of 1.5 gallons per 100 square feet.
 - 2. Over base sheet, install two [2] plies in cold adhesive @ specified rate.
- B. Ply Sheet: Install sheet starting at low point of roofing system. Offset laps from laps of preceding ply sheets and align cap sheet without stretching. Lap in direction to shed water. Extend ply sheet over and terminate beyond cants. Starting at the low point of the roof, install two [2] plies, shingle fashion over entire roof area being replaced
 - 1. Embed ply sheet in a solid application of cold fluid-applied adhesive applied at rate required by roofing system manufacturer. Rate shall be two [2] gallons per 100 square feet.
- C. Finishing sheet: Embed finishing sheet in a solid application of cold fluid applied adhesive at the rate of two [2] gallons per 100 square feet.
- D. Surfacing of roof system: Owner, contractor and manufacture to walk roof membrane after all repair has been completed to ensure the membrane is ready to receive new Cool Roof coating. Repair all defects found prior to coating. Apply primer @ the rate of one [1] gallon per 100 square feet. Apply coating system over entire roof area to include baseflashings at the rate of four [4] gallons per 100 square feet.

3.6 FLASHING AND STRIPPING INSTALLATION [Baseflashings in replacement areas]

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Flashing Sheet Application: Adhere flashing sheet to substrate in flashing adhesive at rate required by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 12 inches above roofing membrane and 6 inches onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
- D. Install stripping, according to roofing system manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.
 - 1. Flashing-Sheet Stripping: Install flashing-sheet stripping by heat welding and extend onto roofing membrane.
- E. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with stripping and extend a minimum of 4 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
 - 1. Install flashing-sheet stripping by same method as installing base flashing.
 - 2. Overflows: Remove and replace [e] lead flashing with new 4lb lead and strip in as specified.

3.7 JOB SPECIFIC DETAILS

- A. Counterflashing: install per: Division 7 Sheetmetal and flashing section
- B. Vent stacks: Furnish and install new 4lb.lead flashing and strip in as specified.
- C. GSM equipment platform cover: Mechanically remove with wire wheel all rust to expose clean metal. Apply metal primer over entire metal surface at the rate of one [1] gallon per 100 square feet. Apply base coat @ the rate of three [3] gallons per 100 square feet. While base coat is still wet, embed reinforcing mat, with no voids or wrinkles. Allow to cure. Apply top coat @ the rate of two [2] gallons per 100 square feet.
- D. Baseflashings: Check laps on all baseflashings. All open laps shall be first seam with elastomeric mastic to make watertight. The lap shall then be completely three [3] coursed with white elastomeric mastic and reinforcing mesh. Furnish and install new Cool Roof coating as specified.
- E. Pitch pans: Using a wire wheel clean steel support to clean metal. Prime steel and related roof area at base. Apply base coat of urethane system @ the rate of three [3] gallons per 100 square feet. While base coat is still wet, embed reinforcement and work into base with no wrinkles or voids. Allow to cure for twenty four [24] hours and then apply top coat at the rate of two [2] gallons per 100 square feet. Extend system up the steel support a minimum of eight [8] inches and onto the roof membrane a minimum of four [4].
- F. Walkpads: Carefully lift all walk pads and set aside for re-use. Install new coating system and re-install walkpads to original position.
- G. Skirt flashings: Furnish and install new three [3] inch GSM skirt with a kick and a hem on all [e] counterflashings on curbs, fans, etc. [e] metal flashings of two [2] inches or less. Secure with washered fasteners six [6] inches O.C.
- H. Metal edge: Trim back membrane to exposed two [2] inches of clean metal. Prime area and set six [6] inch wide band of reinforcing ply in a continuous bed of mastic.
- I. Blocking: Change out all wood blocking with new, hard rubber triangle blocking and secure pipes to blocking.
- J. Drains: Remove strainer and set aside for reinstallation. Ensure drain is free and clear. Tighten all bolts. Over a primed surface, feather two [2] plies, shingle around drain perimeter in cold adhesive.

3.8 FIELD QUALITY CONTROL

- A. Manufacturer's Technical Representative: Contractor will engage a qualified manufacturer's technical representative acceptable to Owner for a minimum of [2] full-time days on site to perform roof tests and inspections and to prepare test reports
- B. Test Cuts: Before flood coating and surfacing built-up roofing membrane, test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
 - 1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
 - 2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

SECTION CONTINUES ROOFING INSTALLER'S WARRANTY

- A. WHEREAS **<Insert name>** of **<Insert address>**, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner: **<Insert name of Owner.>**
 - 2. Address: **<Insert address.>**
 - 3. Building Name/Type: **<Insert information.>**
 - 4. Address: **<Insert address.>**
 - 5. Area of Work: **<Insert information.>**
 - 6. Acceptance Date: **<Insert date.>**
 - 7. Warranty Period: **<Insert time.>**
 - 8. Expiration Date: **<Insert date.>**
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. Lightning
 - b. Peak gust wind speed exceeding 70 mph

- c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this **<Insert day>** day of **<Insert month>**, **<Insert year>**.
1. Authorized Signature: **<Insert signature.>**
 2. Name: **<Insert name.>**
 3. Title: **<Insert title.>**

END OF SECTION 07511

SECTION 07620 - SHEET METAL FLASHING

PART 1 - GENERAL-

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following sheet metal flashing for Public Safety Building and Civic Center
 - 1. Coping cap flashing
 - 2. Counterflashings.
 - 3. Termiantions
- B. Related Sections include the following:
 - 1. Division 7 Section 07511 Roofing Restoration for installing new baseflashings and existing roof restoration.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and coping to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. **Fabricate and install metal flashings** capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.
 - 1. Temperature Change (Range) 120 deg, ambient; , material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- C. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Sheet Metal Flashing: 12 inches long. Include fasteners, **clips**, closures, and other attachments.
 - 2. Trim: 12 inches long. Include fasteners and other exposed accessories.
 - 3. Accessories: Full-size Sample.

1.5 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.7 COORDINATION

- A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 SHEET METALS

- A. Galvanized steel sheet: ASTM A 526, twenty four [24] gauge GSM – counterflashing, scuppers gravelstops and weatherhead flashings.
 - 1. Finish: **Standard.**
- B. Galvanized steel sheet : ASTM A 526 twenty four [24] gauge GSM -coping
 - 2. Finish : Kynar coated- color chosen by owner
- C. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet.

2.3 UNDERLAYMENT MATERIALS

- A. Peel-n-stick Sheet: Self adhering SBS modified bitumen sheet Product meets ASTM D 6163 Type 1 Grade S, by Tremco.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets..
- C. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Solder for Lead: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
- E. Burning Rod for Lead: Same composition as lead sheet.
- F. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- G. Elastomeric Sealant: ASTM C 920, elastomeric **polyurethane** polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- H. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- I. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with **elastomeric** sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured

2.6 SHEET METAL FABRICATIONS

- A. Coping Flashing /gravelstop/weatherheads: Fabricate from the following material:
 - 1. Galvanized Steel: ASTM A 526 **minimum twenty four [24] gauge** thick.
- B. Counterflashing/scuppers/counterflashings: Fabricate from the following material:
 - 1. Galvanized Steel: ASTM A 526 **minimum twenty four [24] gauge** thick.
- C. Roof-Penetration Flashing: Fabricate from the following material:
 - 1. Lead: 4 lb / sq ft, hard tempered.

2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 1. Adhere TF flashing tape to sheet metal flashing and trim where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of peel-n-stick and extend down face of wall a minimum of six [6] inches
 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and **butyl** sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- F. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1 ¼ inches for nails and not less than 3/4 inch for wood screws with washers..
 1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
 2. Aluminum: Use aluminum or stainless-steel fasteners.
 3. Copper Use copper or stainless-steel fasteners.
 4. Stainless Steel: Use stainless-steel fasteners.
- G. Seal joints with **butyl** sealant as required for watertight construction.
 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 degrees, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 degrees
 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1 ½ inches except where pretinned surface would show in finished Work.
 - 1. Pretinning is not required for **lead**
 - 2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
 - 3. Where surfaces to be soldered are lead coated, do not tin edges, but wire brush lead coating before soldering.
 - 4. Lead-Coated Copper Soldering: Wire brush edges of sheets before soldering.
 - 5. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.
- I. Transition metal flashings:
 - 1. Furnish and install new GSM transition metal to provide a watertight/weathertight transition from metal coping to building wall or counterflashing to wall.
 - 2. Secure metal with washered fasteners.

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Pipe Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for **butyl** sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with **butyl** sealant.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 - 2. Seal with **elastomeric** sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.
- E. Coping: Furnish and install 22 gauge continuous cleat and secure to nailer. Fabricate, furnish and install new coping metal. Secure interior face with washered fasteners, into slotted holes eighteen [18] inches O.C. Lap joints centered over joint plate a minimum of four [4] inches.

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620