CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECTS

PROJECT MANUAL

Second Street STAIR Center

SPECIFICATION NO. 23-11603-C

March 2024

ADVERTISEMENT DATE: March 5, 2024

PRE-BID CONFERENCE: March 12, 2024

BID OPENING DATE: 2:00PM Thursday, April 4, 2024

1947 CENTER STREET, 4th Floor, BERKELEY, CALIFORNIA 94704 (510) 981-6400

Document 00 0101

CITY OF BERKELEY

DEPARTMENT OF PUBLIC WORKS

PROJECT MANUAL

Second Street STAIR Center

at

1601 Second Street
Berkeley, CA 97710

SPECIFICATION NO. 23-11603-C
February 2024

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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, April 4, 2024** for the following public work:

SPECIFICATION NO. 23-11603-C
CITY OF BERKELEY
Second Street STAIR Center
1601 Second Street

1.02 Project Description: Site improvements for placement of pre-manufactured single-occupancy shelters, including ancillary work in accordance with the terms and conditions of the Contract Documents. Work shall be completed within **98** 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 Tuesday, March 5, 2024 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, Titus Chen, 1947 Center Street, 4th Floor, Berkeley, CA 94704, by Email at TChen@berkeleyca.gov or by Telephone at (510) 981-6410 or by FAX **(510) 981-6390**.

1.04 Planholders List:

Bidders are responsible for notifying Titus Chen, via email at TChen@berkeleyca.gov to be included on the Planholders List. Please include the following in the email subject header: "Planholders list for Specification No. 23-11603-C for Second Street STAIR Center". 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 1601 Second Street**.** The location of work is not open to the public. 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 1601 Second Street, at **2:00 PM, Tuesday, March 12, 2024**

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, Additive Alternate A1, and Allowance 1 only (Bid Items 1 – 3).

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 1601 Second Street, at **2:00 PM, Tuesday, March 12, 2024**. The location of work is not 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, 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.

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.

D. Document 00 6536 (Guaranty), fully executed by successful Bidder. Submit **two** originals.

E. Insurance certificates and endorsements required by Document 00 7316 (Supplementary Conditions — Insurance and Indemnification): Submit **one** original set.

F. Document 006580 (City Contracting Policies), fully executed by successful bidder. Submit **one** original set.

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: Second Street STAIR Center at 1601 Second Street, Specification No. 23-11603-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 Items 2-11.	
2	Additive Alternate No. A1: a. Retain existing planters containing plants that are identified to be relocated or transplanted, as shown on Sheets L1.4 and L1.5. b. Existing plants identified to be relocated or transplanted are to be hand watered and kept healthy in original planters until project completion, as shown in Detail 1, Sheet L2.4. c. Empty, salvage, and store all other existing planters, as shown on Detail 1, Sheet L2.4. d. Provide and install irrigation equipment and lines as shown on Sheets L3.1 and L3.2. End lateral lines at stub outs capped at grade. e. Provide and install chain link fence slats, as shown on Sheet L1.2 and Detail 1, Sheet L2.1	
3	Allowance 1: Site Security – Provide overnight and weekend site security during construction. See Appendix A for scope of security and patrol services.	
	Total Bid Price: **(Bid Items 1 through 3)**	

Total Bid Price: (Bid Items 1 Through 3)

_____

(Words)

Bid Alternates (Bid Alternates B1 through B7 and Unit Rate U1 are to be priced for City consideration to be included in the project at the sole discretion of the City. Bid Alternate B1-B7 and Unit Rate U1 will not be used at bid opening.)

ITEM	DESCRIPTION	PRICE ($)
4	Bid Alternate B1: Provide and install site furnishings as shown on Sheet L1.2; Detail 1, Sheet L2.2; and Sheet L2.3.	
5	Bid Alternate B2: a. Install existing planters, as shown on Sheets L1.4, L1.5, and L2.4. b. Provide and install new planters, planting material, and plants, as shown on Sheet L1.4; Sheet L1.5; Detail 2, Sheet L2.2; and Sheet L2.4. c. Transplant existing plants identified to be transplanted to new locations, relocate planters that are identified to be relocated, as shown on sheets L1.4, L1.5, and L2.4. d. Complete installation of irrigation as shown on sheet L3.1.	
6	Bid Alternate B3: Provide and apply painted pattern to asphalt as shown on Sheets L1.2 and L1.3, and Detail 3, Sheet L2.2.	
7	Bid Alternate B4: Provide and install artificial turf as shown on Sheets L1.2 and L1.3, and Details 2 and 3, Sheet L2.1.	
8	Bid Alternate B5: Provide and install acrylic privacy screens as shown on Sheet L1.2 and Details 5 and 6, Sheet L2.1.	
9	Bid Alternate B6: Provide and install 5 freestanding pergolas with sunshade fabric as shown on Sheet A1.02, L1.2, L1.3, and Detail 4, Sheet L2.1.	
10	Bid Alternate B7: Provide and install 2 weatherproof freestanding pergolas as shown on Sheets A1.02, A2.01, A2.02, A8.02, L1.2, and L1.3.	
11	Unit Rate U1 ($/SF): a. Provide and paint surfaces of the Pallet Shelters with urethane paint at locations approved by the City. Prepare surfaces and install base coat and minimum 2 top coats per manufacturer's instructions and recommendations. b. Paint: Sherwin Williams Emerald Urethane Trim Enamel, Semi-Gloss Ultradeep Base, or approved equivalent. c. Colors: Up to six colors, approved by the City.	

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. 23-11603-C
Second Street STAIR Center
at 1601 Second Street**.**

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 200 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 oriole 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 bold), 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 _____, 201__

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: _____, **[201]** 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
Second Street STAIR Center AT 1601 Second Street

The Contract Sum of your contract is X Dollars and X Cents ($X).

1. Five 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 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 of Document 00 6113.13 (Construction Performance Bond), executed by you and your surety.

   c. Deliver to Owner **two** originals of Document 00 6113.16 (Construction Labor and Material Payment Bond), executed by you and your surety.

   d. Deliver to Owner original set of the insurance certificates with endorsements required under Document 00 7316 (Supplementary Conditions – Insurance).

   e. Deliver to Owner **two** original copies of Document 00 6536 (Guaranty), each executed by you.

   f. Deliver to Owner three original copies 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 **Titus Chen (510) 981-6410.** Questions regarding bonds and insurance may be directed to **Titus Chen** at the same number. All other inquiries regarding the Project should be directed to **Titus Chen.**

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: _____, **[202__]**

[Copy of Resolution Attached]

END OF DOCUMENT

DOCUMENT 00 5200

AGREEMENT

THIS AGREEMENT, dated this **[date]** day of **[Month], [202_]**, by and between **[Contractor]** whose place of business is located at **[Contractor's 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 23-11603-C

Second Street STAIR Center
at
1601 Second Street

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 $X for completion of Work in accordance with Contract Documents as follows: [HERE INSERT LUMP SUM, UNIT PRICES, OR CONTRACTOR'S BID IN WORDS AND NUMBERS]

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 **84** calendar days from the Commencement Date.

B. Contractor shall achieve Final Completion of the entire Work **98** calendar days from the Commencement Date.

ARTICLE 3 – PROJECT REPRESENTATIVES

3.01 CITY'S PROJECT MANAGER

A. City has designated Titus Chen 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. **Siegel & Strain Architects** furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.

B. Architect/Engineer has designated **[_____]** 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 0 0 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 7319	Supplemental Conditions – Hazardous Materials
Document 00 7380	Apprenticeship Programs
Document 00 9113	Addenda [LIST ADDENDA ISSUED]
Specifications	Divisions 1 through 33

Appendices listed in Document 00 0110

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

By:_____
City Manager

_____
(Print Name)

Attest:
CITY OF BERKELEY

_____
City Clerk

_____
(Print Name)

[INSERT CONTRACTOR NAME;

By: _____
(Signature)

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

By: _____
(Signature)

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: _____, 202__

To: _____
(Contractor)

Address: _____

_____

CONTRACT FOR: **City of Berkeley Second Street STAIR Center AT 1601 Second Street**

CONTRACT NO: [XXXXX]

You are notified that the Contract Time under the above Contract will commence to run on _____ **[202__]**. 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 _____,**[202__]** and _____, **[202__]**, 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. **[Other]**

OWNER

By: _____

Its: _____

END OF DOCUMENT

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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]** as Principal, Specification Number **23-11603-C,** dated the _____ day of _____ _____, 20____ (the "Contract"), titled Second Street STAIR Center in the amount of $X, 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	**SURETY**
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature:_____	Signature:_____
Name and Title:_____	Name and Title:_____
Address:_____	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]** as Principal, Specification No. **23-11603-C** dated the _____ day of _____, 20___ (the "Contract"), titled Second Street STAIR Center in the amount of **$X**, 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	**SURETY**
Company: (Corp. Seal)	Company: (Corp. Seal)
_____	_____
Signature	Signature
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Street Address	Street Address
_____	_____
City, State, Zip Code	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 _____, 201__, by and between City of Berkeley ("City"), whose address is 2180 Milvia Street, Berkeley, California 94704, **[Contractor]** ("Contractor"), whose place of business is located at **[Contractor's 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 Second Street STAIR Center located at **1601 Second Street** in the amount of **$X** dated _____ _____, 201__ (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: **City's Specification No. :**	**Contractor:**

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:	**City Representative Response:**
o Accepted	o Accepted
o Not Accepted	o Not Accepted
o Accepted As Noted	o Accepted As Noted
o Received Too Late	o Received Too Late
Remarks:_____	**Remarks:**_____
_____	_____
By:_____	**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]**("Contractor"), whose place of business is at **[Contractor's Address]**.

RECITALS

A. City and Contractor entered into Contract Number **[XXXXX]**(the "Contract") for construction of City **Second Street STAIR Center** located at **1601 Second Street,** 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 [X Dollars and X Cents ($$X)] 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 Second Street STAIR Center located at 1601 Second Street, 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
- 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)
- Certification Of Compliance With Equal Benefits Ordinance
- Taxpayer Identification Report
- Right to Audit Form
- Sanctuary City Compliance Certification
- 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
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
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
AI=American Indian
B=Afro American
C=Caucasian
H=Hispanic (Mexican, Puerto Rican, Spanish, Cuban, Chicano, Central or South American)
8/91

**M = Male
**F = Female

Signature: _____ Date: _____
Contractor/Subcontractor

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

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

The undersigned, an authorized agent of _____ (hereafter "Contractor"), has had an opportunity to review the requirements of Berkeley City Council Resolution No. 59,853-N.S (hereafter "Resolution"). Contractor 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. Contractor understands the meaning of the following terms used in the Resolution:

> "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).
>
> "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."
>
> "Oppressive State" means: 1) Tibet Autonomous Region and the Provinces of Ado, Kham, and U-Tsang; and Burma (Myanmar)

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.

Contractor further understands and agrees that Contractor's failure to comply with the Resolution shall constitute a 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.

The undersigned is familiar with, or has made a reasonable effort to become familiar with, Contractor's business structure and the geographic extent of its operations. By executing this Statement, Contractor 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, Contractor 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: _____
Signed: _____ Date: _____
Business Entity:

Contract description/Specification No.: Second Street STAIR Center / 23-11603-C

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

Signed: _____ Date: _____

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) #: _____

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.

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: _____

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:

"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.

a. "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:

END OF DOCUMENT

DOCUMENT 007200

GENERAL CONDITIONS

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 indentified, 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 Contract 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

N/A

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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.

E. Environmental Impairment Liability Insurance covering bodily injury and property damage utilizing an occurrence policy form, in an amount no less than **$1,000,000** combined single limit for each occurrence, subject to a **$1,000,000** aggregate applicable to each job, with defense costs payable in addition to policy limits. The minimum deductible or self-insured retention permissible is **$25,000** each occurrence.

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. designates the following as Oppressive States for the purposes of this Contract:

1. Tibet Autonomous Region and the provinces of Ado, Kham, and U-Tsang.

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 00700 (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 00700 (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.

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.

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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. 23-11603-C

CITY OF BERKELEY

SECOND STREET STAIR CENTER

1201 SECOND STREET

[DOCUMENT TO BE COMPLETED AS ADDENDA DURING BID PERIOD]

[If a conformed copy is created, delete bracketed line above and replace with the following:]

The following Addenda were issued, modifying the Project Manual:

Addendum No. 1, issued on **[date]**
Addendum No. 2, issued on **[date]**
[continue as appropriate]

(Addenda have been incorporated into the conformed Project Manual.)

END OF DOCUMENT

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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 **Second Street STAIR Center** located at **1601 Second Street**. The Work includes, without limitation, **site improvements required for the placement of pre-manufactured single-occupancy shelters, accessibility improvements, landscaping, and related 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):

Bid Item 1: All labor, material, services, and equipment necessary for the completion of all of the works shown in the Contract Documents other than work separately provided for under other bid items, i.e. excluding Bid Items 2-11.

Bid Item 2: Additive Alternative A1: Additional cost of:

a. Retain existing planters containing plants that are identified to be relocated or transplanted, as shown on Sheets L1.4 and L1.5.
b. Existing plants identified to be relocated or transplanted are to be hand watered and kept healthy in original planters until project completion, as shown in Detail 1, Sheet L2.4.
c. Empty, salvage, and store all other existing planters, as shown on Detail 1, Sheet L2.4.
d. Provide and install irrigation equipment and lines as shown on Sheets L3.1 and L3.2. End lateral lines at stub outs capped at grade.
e. Provide and install chain link fence slats, as shown on Sheet L1.2 and Detail 1, Sheet L2.1.

B. Allowances:

Bid Item 3: Allowance 1: Site Security – Provide overnight and weekend site security during construction. See Appendix A for scope of security and patrol services.

C. Bid Alternates: Bid Alternates are to be priced for City consideration. These items will not be used to determine lowest bid on bid opening day. However, one or more may be added to the project at the sole discretion of the City.

Bid Item 4: Bid Alternate B1: Additional cost to provide and install site furnishings as shown on Sheet L1.2; Detail 1, Sheet L2.2; and Sheet L2.3.

Bid Item 5: Bid Alternate B2: Additional cost to:

a. Install existing planters, as shown on Sheets L1.4, L1.5, and L2.4.
b. Provide and install new planters, planting material, and plants, as shown on Sheet L1.4; Sheet L1.5; Detail 2, Sheet L2.2; and Sheet L2.4.
c. Transplant existing plants identified to be transplanted to new locations, relocate planters that are identified to be relocated, as shown on sheets L1.4, L1.5, and L2.4.
d. Complete installation of irrigation as shown on sheet L3.1.

Bid Item 6: Bid Alternate B3: Additional cost to provide and apply painted pattern to asphalt as shown on Sheets L1.2 and L1.3, and Detail 3, Sheet L2.2.

Bid Item 7: Bid Alternate B4: Additional cost to provide and install artificial turf as shown on Sheets L1.2 and L1.3, and Details 2 and 3, Sheet L2.1.

Bid Item 8: Bid Alternative B5: Additional cost to provide and install acrylic privacy screens

as shown on Sheet L1.2 and Details 5 and 6, Sheet L2.1.

Bid Item 9: Bid Alternate B6: Additional cost to provide and install 5 freestanding pergolas with sunshade fabric as shown on Sheet A1.02, L1.2, L1.3, and Detail 4, Sheet L2.1.

Bid Item 10: Bid Alternate B7: Additional cost to provide and install 2 weatherproof freestanding pergolas as shown on Sheets A1.02, A2.01, A2.02, A8.02, L1.2, and L1.3.

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

Bid Item 11: Unit Rate U1 ($/SF): Provide and paint surfaces of the Pallet Shelters with urethane paint at locations approved by the City. Prepare surfaces and install base coat and minimum 2 top coats per manufacturer's instructions and recommendations. Paint to be Sherwin Williams Emerald Urethane Trim Enamel, Semi-Gloss Ultradeep Base, or approved equivalent. Up to six colors, approved by the City.

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. Remove two (2) existing congregate sleeping trailers.

B. Remove one (1) existing laundry trailer and replace with ADA compliant laundry trailer.

C. Renovate one (1) existing restroom trailer.

D. Remove access ramps and stairs to existing trailers and replace/configure after site work is completed.

E. Assemble thirty-two (32) individual shelter units at locations indicated in the Contract Drawings.

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. None expected.

1.09 WORK DAYS AND HOURS

A. Work Days and hours: Monday-Friday inclusive, **[7:00 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).

1. Pacific Mobile Structures, Inc. will remove two (2) existing congregate sleeping trailers; remove and replace one (1) existing laundry trailer; renovate one (1) existing restroom trailer; and remove and replace trailer access ramps and stairs.

2. Pallet PBC will erect and install thirty-two (32) pre-manufactured individual shelter units at locations indicated on Plans.

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 **Cedar Street and/or Virginia Street** along the route indicated. The entrance to the access road is protected with a gate and lock. Contractor shall insert Contractor's own lock in series and 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. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws. Do not unreasonably encumber Site with materials or equipment.

C. 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.

D. 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.

E. 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.

F. The Contractor shall follow all city ordinances in force during the duration of this Contract.

G. It is essential that the Contractor perform the Work with as little interference and disturbance as possible to the surrounding neighborhood.

H. 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 CONSTRUCTION STAKING, MONUMENT PROTECTION AND REPLACEMENT

A. Notify City at least three (3) Business Days prior to the need for initial staking. City will provide engineering surveys, City benchmarks, corner records, reference points, and/or monument cards that in City's judgment are necessary to establish site elevations for the Contractor to establish construction stakes in order to enable Contractor to proceed with the Work.

B. If Contractor finds any additional information is necessary, notify City in writing 2 Business Days in advance. City shall have no liability for any inadequacy unless Contractor notifies City and City fails to cure within 3 Business Days of such notice.

C. Contractor shall be responsible for laying out the Work and provide all construction staking. Contractor shall replace or repair construction stakes at own expense.

D. Contractor shall perform brush clearing and traffic control, as necessary, in City's sole judgment.

E. The Contractor shall protect and preserve all existing survey monuments, benchmarks, reference points, property monuments and stakes.

F. Whenever Contractor knows or reasonably should know that any Work activity is likely to damage or destroy any survey monuments, benchmarks, reference points, property monuments, or construction stakes, or require relocation because of necessary changes in grades or locations, provide at least 3 Business Days advance notice to City. Survey monuments, benchmarks, reference points and property monuments shall not be disturbed until authorized by the City.

G. Whenever the Contractor disturbs or removes any survey monuments, benchmarks, reference points, or property monuments, the Contractor shall replace the monument in accordance with

City Standard Plan 8090 or City Standard Plan 8091, as applicable. Standard Plans are available upon request. Monument casings (boxes and lids) shall be provided by the Contractor, and dome brass markers shall be supplied by the City.

H. In the event that any non-referenced monuments become in danger of being disturbed due to construction, the Contractor shall cease the threatening activity and notify the City immediately. Response to endangered monuments is a priority call, and each monument shall be referenced in accordance with the City of Berkeley Monument Reference Guidelines, available upon request. In no case may an unreferenced monument be damaged during construction.

I. Should any monument not designated for replacement sustain damage during construction, the Contractor shall bear the expense for rebuilding it as well as for the survey work the City survey crew or its survey consultant must perform in the process. In any instance where the City deems a damaged monument to be irreplaceable, the contractor shall be fined $20,000 per monument.

J. Monument replacement must be done in a neat, workman-like manner. Pavement cuts shall be accurate, with vertical cuts to exact dimensions as shown on the Standard Plans. Monument boxes and lids shall be placed at the proper finished grade and as detailed by Standard Plan 8090 or Standard Plan 8091. Existing monument lids shall be salvaged by the Contractor and delivered to the City.

K. Each replacement monument shall be constructed such that the center of the dome brass marker is set within 0.04 foot of the referenced position. The new dome brass marker shall not receive final punching prior to seven (7) calendar days after completion of the monument construction.

L. In any event, notify City whenever any survey monuments, benchmarks, reference points, or property monuments are lost or destroyed or require relocation because of necessary changes in grades or locations.

M. If the City has elected to reference known monuments around or within the project site, a copy of the corner records for the referenced monuments shall be provided to the Contractor prior to the start of construction. For each monument that has been disturbed or removed, the replacement monument location(s) will be established by the City's survey crew or its survey consultant after final pavement is completed and upon request by the Contractor.

N. All City of Berkeley Monuments located within the project area must be referenced, prior to work commencing, by a licensed land surveyor as required by Section 8771 of the Business and Professions Code. Corner Records of this work must be submitted for filing to both the County Surveyor of Alameda County, and the City of Berkeley, Public Works Department, Engineering Division, Survey Section.

O. Illegible survey requests or requests without proper notification (at least 3 Business Days in advance), may result in delayed response. No extension of Contract Time will be allowed due to such delays.

1.16 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. **None**

1.17 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 Interceptor:** EBMUD
3. **Sewer lines**: Berkeley Public Works Department
4. **Telephone Conduit**: AT&T
5. **Cable**: Comcast
6. **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. 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.

F. In addition to reporting, if a utility is damaged, Contractor must take appropriate action as provided in Document 00 7200 (General Conditions).

G. 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).

1.18 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 1901
   Oakland, CA 94612

   (510) 286-7037

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).

1.19 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 per Day 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. **Pallet Shelters: Thirty (30) 64 square foot pre-packaged shelter units and two (2) 100 square foot pre-packaged shelter units, to be assembled on site by others. Utility connections and field modifications to accept fire sprinklers and appurtenances are in Contract and described in the Contract documents.**

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

[OPTION IF THERE ARE PERMITS: Permit copies follow this page numbered consecutively as 01 1100]

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 **Second Street STAIR Center**
Contract Number _____

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

To: City of Berkeley
Attention: **Titus Chen**
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 (2019 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
b. California Electrical Code (2019 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
c. California Plumbing Code (2019 Edition or latest applicable code) as amended by applicable local ordinances for plumbing, sewage disposal and health requirements.
d. California Mechanical Code (2019 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
e. California Energy Code (2019 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
f. California Green Building Standard Code (2019 Edition or latest applicable code) as amended by applicable local ordinances for all construction work.
g. International Fire Code (2019 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

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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: Polyclorinated 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:

Section	Inspections and Tests	Paid by
Section 32 1216- Asphalt Concrete	Compaction	Paid by Contractor.
Section 32 1313- Concrete Paving	Slump Tests Compressive Strength	Paid by Contractor. Paid by Contractor.

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 deducted for Contract Sum.

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.

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 soley 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 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

C. Demolition Specification 02 4000

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 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.

1.11 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 ¼" of rain in a twenty-four period.
        iii. No paving of bottom lift if previous seventy-two (72) hour period experienced more than ½" 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

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.

B. Demolition Specification 02 4000

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 **3** copies of plan within **7** days of date established for the Notice to Proceed.

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 3 copies of report. 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

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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

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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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WATER POLLUTION CONTROL 01 5700

1.01 GENERAL

The Contractor shall be responsible for implementing and managing these systems during the life of the project. The SPCP shall conform to all applicable requirements in Section 13-2, “Water Pollution Control,” of the State Standard Specifications these Special Provisions, Section 30, Stormwater Pollution Control.

1.02 SUBMITTAL

The Contractor shall submit a **Water Pollution Control Program** (WPCP) to address the storm drain and various improvements to the Engineer for approval. The WPCP shall conform to the requirements of the City of Berkeley and these Specifications.

1.03 EXECUTION

The WPCP shall be prepared using the latest template posted on the State’s Construction stormwater website.

Dewatering work shall include:

1. Keep all excavations reasonably free from water during construction.
2. Disposal of water shall not damage property or create a public nuisance.
3. Have on hand pump equipment and machinery in good working condition for emergencies and workmen available for its operation.
4. Dewatering systems shall operate continuously until foundations are poured or trenches are backfilled.
5. Groundwater shall be controlled to prevent softening of the bottom of excavations, or formation of “quick” conditions.
6. Dewatering systems shall not remove natural soils.
7. Control surface runoff to prevent entry or collection of water excavations.
8. Release of groundwater shall be controlled to prevent disturbance of the natural foundation soils or compact fill.
9. There shall be no discharge of turbid water on site.
10. Discharge or disposal of water shall be controlled to prevent erosion

The Contractor shall not perform work that may cause water pollution until the WPCP has been approved by the Engineer. The Engineer's review and approval shall not waive any contract requirements and shall not relieve the Contractor from complying with Federal, State and local laws, regulations, and requirements.

1.04 MEASUREMENT AND PAYMENT

The contract lump sum price paid for “Water Pollution Control Program” shall include full compensation for furnishing all labor, materials, tools, equipment, dewatering, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the WPCP and inspecting water pollution control practices as specified in the Standard Specifications and these Specifications, and as directed by the Engineer.

Full compensation for implementation and maintenance of the water pollution control program shall be considered as included in the contract lump sum price paid for Water Pollution Control and no additional compensation will be allowed therefor.

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MOBILIZATION / DEMOBILIZATION 01 7113

1.01 GENERAL

Mobilization shall conform to the provisions in Section 9-1.16(D), “Mobilization,” of the State Standard Specifications, and shall consists of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies incidental to the project site, for the establishment of all staging areas and other facilities necessary for work on the project and for all other work and operations which must be performed or for project costs incurred prior to beginning work on the various Contract items. Mobilization shall include obtaining insurance and bonds, obtaining and paying for all permits by other agencies if applicable, furnishing temporary construction utilities, installing construction and other construction facilities all as required for the proper performance and completion of the work.

The work of this bid item also includes demobilization. Demobilization shall include final cleaning and restoration of the job site, removal of all temporary facilities and equipment from the work area, disconnection of the temporary construction utilities and turnover of project to the City.

1.02 MEASUREMENT AND PAYMENT

Full compensation for completing the requirements of this section shall be considered as included in the lump sum price paid for “Mobilization”.

Partial payments for Mobilization shall not exceed the following:

(1) When 5 percent of the original contract amount is earned, 50 percent of the amount bid for Mobilization, or 5 percent of the original contract amount, whichever is lesser, may be paid.

(2) When 10 percent of the original contract amount is earned, 75 percent of the amount bid for Mobilization or 7.5 percent of the original contract amount, whichever is lesser, may be paid.

(3) When 20 percent of the original contract amount is earned, 95 percent of the amount bid for Mobilization, or 9.5 percent of the original contract amount, whichever is lesser, may be paid.

(4) When 50 percent of the original contract amount is earned, 100 percent of the amount bid for mobilization, or 10 percent of the original contract amount, whichever is lesser, may be paid.

(5) Upon completion of all work on the project, (including: punch list items, cleaning up and removal of all temporary facilities and equipment from the project site) payment of any amount bid for Mobilization in excess of 10 percent of the original contract amount will be paid.

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CONSTRUCTION STAKING 01 7123

1.01 GENERAL

This section specifies the work for construction staking which consists of providing all labor, tools, equipment, materials and incidentals necessary to locate by staking all improvements, to the line and grade shown on the Plans.

1.02 EXECUTION

Contractor shall furnish all land surveys, establish all base lines and benchmarks and make sufficient detailed surveys needed for working points, lines and elevations. The Contractor shall develop all slope stakes and batter boards. Contractor shall also develop all additional working points, lines and elevations as he or she may desire to facilitate his or her methods and sequence of construction.

All work shall be staked in order to meet the lines and grades shown on the Plans. Copies of all survey cut sheets shall be provided to the City Engineer two (2) working days before the planned work begins.

Finished grade elevations and pipe flowlines shall be within minus five hundredths (-0.05) foot of elevation and plan location.

Prior to concrete pouring, formwork and survey staking shall be reviewed and approved by the City Engineer.

1.03 MEASUREMENT AND PAYMENT

The contract lump sum price paid for “Construction Staking” shall include full compensation for furnishing all labor, materials, tools, equipment, supervision, and incidentals and for doing all the work involved as specified in the Standard Specifications and these Specifications, and as directed by the Engineer as may be required to complete the work.

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DEMOLITION 02 4000

1.01 GENERAL

Demolition work shall consist of and include all demolition, sawcutting, removals, salvaging, and stockpiling, including concrete pavement, asphalt pavement, signs, baserock, and other miscellaneous demolition as shown on the Plans or specified herein. The Contractor shall obtain all special permits and licenses and give all notices required for performance and completion of the demolition and removal work, hauling, and disposal of debris.

Contractor shall review with City's Representative the exact limits of work and extent of materials to be removed.

A. Examine site and structures and determine exact nature and status of structural elements and above ground and below ground utilities prior to commencing demolition.
B. City assumes no responsibility for actual condition of items or structures to be demolished.
C. Prior to commencing the work, perform a site survey to identify existing areas of damage to adjacent building areas and other buildings.

1.02 SUBMITTALS

Contractor shall submit a schedule indicating proposed methods and sequence of operations for selective demolition work for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required.

A. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of adjacent building uses.
B. Coordinate continued occupancy with adjacent building tenants.

1.03 EXECUTION

Standards
All work shall conform to ANSI A10.6, Safety Requirements for Demolition Operations and to the codes and regulations of the City.

Attention is also directed to Section 15, "Existing Facilities," of the State Standard Specifications.

Concrete removal work shall be done in accordance with Section 15-1.03B, "Removing Concrete", of the Standard Specifications, these Specifications, the Contract Plans and as directed by the Engineer.

Residue from cutting operations shall not be permitted to flow into storm drains or across lanes occupied by traffic and shall be removed from the pavement surface, concurrent with the cutting operation. All excavated material shall be removed and disposed of outside the street right of way in accordance with relevant sections of the State Standard Specifications.

Dust Control shall conform to the provisions of Section 10-5, “Dust Control” of the State Standard Specifications.

Schedule

The Contractor shall receive no additional compensation for delays or inconvenience caused by utility relocations and/or adjustments. The delay caused by these relocations and/or adjustments shall not count towards the Contractors’ “working days.”

Provide a minimum of 72 hours advance notice of demolition activities to the Engineer.

Relocation of Existing Planters: All existing galvanized steel planters located in areas of work to be relocated to a temporary staging area and then placed in their permanent location as directed by owner following paving work. Contractor to relocate planter, soil and plantings, intact. Irrigation connections to be severed in manner approved by the City Engineer.

Protection: Provide temporary barricades and other forms of protection as required to protect the general public from injury due to selective demolition work. Provide protective measures as required to provide free and safe passage of general public to and from occupied portions of building. Erect temporary covered passageways as required by authorities having jurisdiction.

Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

Utilities: The Contractor shall call USA at (800) 642-2444 to mark the locations of all underground utilities at least 48 hours before the intended start of excavation. Any damage to any utility due to the Contractor's operations shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

Affected utility companies include but may not be limited to:

A. Pacific Gas & Electric Company
B. AT&T
C. Comcast
D. EBMUD
E. City of Berkeley Sanitary Sewers
F. City of Berkeley Storm Drains
G. City of Berkeley Electrical

The Contractor is responsible for coordinating with the various utility agencies for lateral adjustment and/or relocation.

Selective Demolition: Perform selective demolition work in a systematic manner. Use methods required to complete work indicated on the Plans in accordance with demolition schedule and governing regulations. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Traffic: Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from the Engineer. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

Extent: Demolish footings to a depth of not less than 18 inches below finish grade. Demolish and remove below-grade wood or metal construction. Break up below grade concrete slabs. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6 inch diameter, roots or other organic matter.

Clean up: The Contractor shall perform daily cleanup operations to keep the job site and adjacent properties free from accumulation of waste materials and debris resulting from the Contractor's operations. The Contractor shall deposit waste material in on-site containers or at a legal disposal area away from the site at the end of each working day.

Nothing herein shall be construed as relieving the Contractor of his/her responsibility for final cleanup of the site as provided in Section 4-1.13, "Cleanup", of the Standard Specifications.

Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to the City.

Demolition: Contractor shall strip the site of all remaining materials not to remain as part of the finished work. All such materials shall be legally disposed of off-site at Contractor's expense except as otherwise noted on Plans. Items to be disposed of off-site include but are not limited to the following:

A. Demolition and removal of concrete pavement, asphalt concrete and base rock;
B. Removal of pavement markings;

If the Contractor damages an existing improvement, which is to remain, he/she shall restore such improvement to as good a condition as existed before the damage or shall replace the improvement, when restoration is not acceptable, with an improvement of at least equal quality. Cost of such restorations or replacements shall be the Contractor's expense.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a straight neat line with a power-driven saw to a minimum depth of 0.17 foot before removing the surfacing.

The Contractor shall be responsible for the removal, hauling away and the disposal of the dirt, broken asphalt, and debris materials. The City of Berkeley's landfill is closed and will not accept any materials disposed under this contract.

The Contractor is responsible for having all underground utilities and covers identified by calling Underground Service Alert (USA) at 1-800-227-2600 prior to commencement of excavation. .

Where any marked or unmarked utility lines or other underground obstruction or piping may be encountered within the work area, notify the City's Representative or the agencies or service utility companies having jurisdiction thereof, and take necessary measures to prevent interruption of service (if live). Should such lines or service be damaged, broken, or interrupted, those services shall be repaired immediately and restored by Contractor at his/her own expense.

Abandoned lines, meters and boxes, obstructions or piping shall be removed, plugged or capped in accordance with the requirements and approval of the agencies affected. It shall be the responsibility of the Contractor to ascertain whether any public facilities exist along the line of work, whether or not shown on the Plans; and Contractor shall, at the Contractor’s expense, do any necessary work to save from damage all such property in or adjacent to the work, and shall repair all damage thereto caused by the Contractor’s operations.

Service connections to adjacent properties requiring removal or adjustment, due to new construction, shall be removed or adjusted during the course of construction operations. The Contractor shall cooperate with the utility companies and/or agencies in such work.

Remove Asphalt Concrete & Base: Roadway base and surfacing shall be removed as required for project improvements in accordance with Section 19, “Earthwork,” of the State Standard Specifications, Specification Section 01 7419 “Construction Waste Management and Disposal”, and these Specifications, as shown on the Plans, and as directed by the Engineer.

Where no joints exists between roadway surfacing to be removed and roadway surfacing to remain in place, the roadway surfacing shall be cut in a neat line to the full depth of the existing pavement with a power driven saw before the roadway surfacing is removed.

The Contractor, at his expense, shall repair materials to be salvaged that are damaged as a result of the Contractor’s operations to the satisfaction of the Engineer.

Nothing in these Specifications shall relieve the Contractor from his responsibilities as provided in Section 7-1.09, “Public Safety,” of the State Standard Specifications.

Remove Concrete Pavement: Existing concrete pavement to be removed shall be completely removed and disposed of in conformance with the provisions in Section 15-3, "Concrete Removal" and Section 14-10, “Solid Waste Disposal and Recycling”, of the State Standard Specifications, Specification Section 01 7419 “Construction Waste Management and Disposal”, these Specifications, as shown on the Plans, and as directed by the Engineer. This bid item also includes removal of base rock as required for the improvements.

1.04 MEASUREMENT AND PAYMENT

The contract lump sum price paid for prepare “Demolition” shall include full compensation for furnishing all labor, materials, tools, equipment, dust control, and incidentals and doing all the work complete in place, including hauling, disposals, sawcutting, and all related incidental work as described herein, as shown on the Plans, and as directed by the City Engineer.

SECTION 10 14 23

PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Panel signs.

1.2 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Panel signs.
2. Fasteners and adhesives.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Panel Signs: Not less than 12 inches (300 mm) square, including corner.
2. Exposed Accessories: Full-size Sample of each accessory type.
3. Full-size Samples, if approved, will be returned to Contractor for use in Project.

E. Product Schedule: For panel signs. Use same designations indicated on Drawings or specified.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Deterioration of finishes beyond normal weathering.
    b. Deterioration of embedded graphic image.
    c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Signs and supporting elements are to withstand the effects of gravity and other loads within limits and under conditions indicated.

1. Uniform Wind Load: As indicated on Drawings.
2. Uniform and concentrated loads need not be assumed to act concurrently.

B. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" andCBC.

2.2 PANEL SIGNS

A. Panel Signs: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Solid-Sheet Sign: Aluminum or Steel sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph and as follows:

    a. Thickness: Manufacturer's standard for size of sign and as required for performance indicated, not less than 0.060 inch (1.52 mm).
    b. Surface-Applied, Flat Graphics: Applied baked enamel or powder coat.
    c. Surface-Applied, Raised Graphics: Applied polymer characters and Braille.

2. Mounting:

    a. Fence-Mounted: With countersunk flathead through fasteners. Provide brackets or plates at reverse of sign, where fastened through expanded-metal fence or gate infill..
    b. Shelter-Mounted: With two-face tape.

3. Surface Finish and Applied Graphics:

    a. Baked-Enamel or Powder-Coat Finish and Graphics: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.
    b. Overcoat: Manufacturer's standard baked-on clear coating.

4. Text and Typeface: Accessible raised characters and Braille typeface as selected by Architect from manufacturer's full range. Finish raised characters to contrast with background color, and finish Braille to match background color.

5. Flatness Tolerance: Sign is to remain flat or uniformly curved under installed conditions as indicated on Drawings and within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner.

2.3 PANEL-SIGN MATERIALS

A. Aluminum Sheet and Plate: ASTM B209 (ASTM B209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Steel Materials:

1. Metallic-Coated Steel Sheet: ASTM A653/A653M, G90 (Z275) coating, either commercial or forming steel.
2. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:

1. For exterior exposure, furnish stainless steel or hot-dip galvanized devices unless otherwise indicated.
2. Exposed Metal-Fastener Components, General:

a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

1) Provide stainless steel fasteners at dissimilar metals.

b. CityFastener Heads: For nonstructural connections, use flathead screws and bolts with tamper-resistant one-way-head slots unless otherwise indicated.

3. Sign Mounting Fasteners:

a. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, and installed in predrilled holes.
b. Provide separation spacers where mounting aluminum to steel or steel to aluminum.

B. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. CityBrackets and Plates: Fabricate brackets, plates to receive through-fastened hardware, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.

1. Aluminum and Steel Brackets: Factory finish brackets with baked-enamel or powder-coat finish to match sign-background color color unless otherwise indicated.
2. Stainless Steel Brackets: Factory finish brackets with No. 4 finish unless otherwise indicated.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.8 METALLIC-COATED STEEL FINISHES

A. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A780/A780M.

B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).

2.9 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that anchorage devices embedded in permanent construction are correctly sized and located to accommodate signs.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Accessible Signage: Install in locations on walls as indicated on Drawings and according to the accessibility standard.

C. Mounting Methods:

1. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.
2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by City.

END OF SECTION

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HOT MIX ASPHALT (TYPE A) 32 1216

1.01 GENERAL

Specifications are for providing asphaltic concrete paving as indicated on drawings. Contractor shall protect concrete pavements and walks, curbs and bases, and other improvements adjacent to the operations with suitable materials. The Contractor shall be responsible for any damage caused by the Contractor's employees or equipment and shall make necessary repairs. All damage caused by the Contractor's operations shall be prepared or replaced as required.

1.02 SUBMITTALS

Contractor shall submit Certificate of Compliance from manufacturer for approval prior to installation.

Contractor shall provide submittal for each Respective manufacturer's product data for manufactured products.

1.03 MATERIALS

Hot Mix Asphalt shall be Type A using the Method process and shall conform to the provision in Section 39 "Hot Mix Asphalt" of the Standard Specifications and these Specifications. Hot Mix Asphalt shall be compacted to a relative compaction of not less than 95 percent.

Aggregate grading for the hot mix asphalt shall conform to the grading specified in Section 39-2.02B "Aggregate Gradations" of the Standard Specifications. The base and leveling courses shall be dense graded, 3/4-inch maximum aggregate size and the surface course shall be medium graded 1/2-inch maximum aggregate size. When material used in the surface course is to be hand raked, 3/8-inch maximum size shall be used.

The amount of asphalt binder to be mixed with the aggregate shall be between 4 percent and 6 percent by weight of the dry aggregate. The exact amount of asphalt binder to be mixed with the aggregate will be approved by the Engineer. The Contractor must submit mix design for approval to the Engineer.

Asphalt binder to be mixed with aggregate shall be a steam-refined asphalt conforming to the provisions in Section 92, "Asphalt Binders" and have a viscosity grade of PG 64-10. The pavement surface upon which hot mix asphalt is to be placed and all adjacent vertical surfaces of existing pavement, curbs, gutters, etc. shall be thoroughly cleaned prior to paving. The Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles before and after paving operations where feasible. All other areas will require hand sweeping. The pavement shall be free of dust, dirt, water, and vegetation prior to paving.

Asphaltic emulsion shall be applied to the surface of existing pavements preparatory to resurfacing with hot mix asphalt, and to all concrete surfaces which will be in contact with hot mix asphalt surfacing. Asphalt emulsion shall be SS-1H. The Contractor shall submit a copy of Certificate of Compliance for asphaltic emulsion

1.04 EXECUTION

1. Placing of Base Course

    a. The Contractor shall call for an inspection by the Engineer and obtain written approval of the subgrade before proceeding with the base course.

b. Base course shall be minimum uniform thickness after compaction of dimensions indicated. Where not indicated, compacted thickness shall be six inches for parking stalls and eight inches for roads, driveways, and aisles of parking areas.

c. Base course shall be placed over finished subgrade and compacted in accordance with Section 26-1.03E Compacting of the State Standard Specifications.

d. After base course has been completed, the Contractor shall call for an inspection by the Engineer and obtain written approval before proceeding with application of the asphalt wearing surface.

2. Placing Asphalt Concrete

a. The asphalt paving machine shall be equipped with an electronic “sonic ski” system with a minimum of three (3) sensors to be positioned a minimum of 10-foot in front, 10-foot behind and adjacent to the drum of the paving machine. The system shall be designed to optimize a smooth and consistent road profile. All settings and inputs shall be programmed and adjusted to yield an average thickness equivalent to the paving thickness shown on the Plans. The engineer can cancel the use of the “sonic ski” system at any point without incurring any penalties by the contractor.

b. Areas to be paved shall be covered with a layer of hot asphalt concrete surfacing not less than the thickness indicated after compaction. Where not indicated, compacted thickness shall three inches for roads, driveways, and aisles of parking areas.

c. Paving asphaltic concrete shall be delivered, laid, rolled, and finished in accordance with Section 39 of the Caltrans Standard Specifications.

d. Before placing asphalt concrete, a tack coat (paint binder) shall be applied to all vertical surfaces against which asphalt concrete surfacing will be placed. Asphaltic emulsion shall be applied to the surface of existing pavements at the approximate rate of one-sixteenth (1/16) gallon per square yard. Pools or unevenly distributed areas shall be redistributed by means of hand brooms. The emulsion shall be applied only so far in advance of the surfacing work that it has sufficient time to set, as required by the Engineer.

e. After a tack coat of asphalt emulsion has been applied, hot mix asphalt shall be spread and compacted. It is contemplated that hot mix asphalt will be laid to a compacted thickness as specified. All loose material tracked out onto the new compacted surface shall be removed before an adjacent pass is made by the asphalt paver. All layers of hot mix asphalt shall be laid using an asphalt paving machine as specified in Section 39, Hot Mix Asphalt, of the Standard Specifications.

f. The Contractor shall taper the new pavement thickness adjacent to the gutters in the streets designated by the Engineer. Tapering to the edge of the gutters shall be performed in such manner that adequate binding of the very fine asphalt material to the existing surface is obtained. Contractor shall, at the direction of the Engineer and pursuant to field conditions, apply additional binding material in these areas prior to the placement of the new hot mix asphalt, and shall adequately rake the coarse material so as to obtain the desired result. Crown heights may be adjusted at the direction of the Engineer. Aggregate segregation will be grounds for rejection.

g. The location of all utility and City-owned structures that are covered over by the new pavement shall be legibly marked with paint on the new pavement and on the adjacent curb and/or sidewalk. In addition, the Contractor must make a list of each utility cover that is paved over and not raised to grade during the paving job (e.g. PG&E utility covers) and must notify the utility in writing of the location of said utility cover and the date that it was paved over. A copy of this written notification must be sent to the City. If utility cover is paved over and not raised to grade during the paving job, the pavement must be at least 1-1/2 inches thick over the utility cover and no depression in the roadway surface can be left over the utility cover. If 1-1/2 inches of pavement cannot be laid over a recessed utility cover, then the hot mix asphalt shall be feathered to the grade of the utility cover and arrangements with the utility must be made to raise it to grade. Hot mix asphalt rolled gutters shall be resurfaced as directed by the Engineer as part of the overlay resurfacing work and no additional payment will be made therefor.

h. Hot mix asphalt shall not be placed when the atmospheric temperature is below 50 degrees F (10 degrees C) or during unsuitable weather.

i. Compaction of the asphalt shall be achieved using mechanical rollers. Rolling shall be performed in such a manner that cracking, shoving, or displacement will be avoided. Any displacement occurring as a result of reversing the direction of the roller or from any cause shall at once be corrected by the use of rakes and fresh asphalt mixture where required.

j. Areas inaccessible to the rollers shall be compacted by use of a power compactor of the high impact vibration place type capable of attaining the same compaction as the rolled areas. An adequate number of rollers shall be used with each paving operation.

k. The completed surface shall be thoroughly compacted, smooth, and true to grade and cross section, free from ruts, humps, depression, irregularities, or segregated material.

l. Finish paving shall conform to finish elevations within plus or minus 0.01 of a foot and shall be level to within plus or minus 1/4 inch in 10 feet when measured with a 10 foot straightedge in any direction. Finish surface of the wearing course shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, cold joints, or other irregularities.

m. Public traffic shall be permitted the use of the street area providing that such traffic does not interfere with the continuity of the paving operations. When street operations are suspended, all equipment shall be removed from portions of the streets that are to be used by the public traffic. Where work is unfinished at a pedestrian crosswalk at the end of a working day, the edge of the paved surface to said crosswalk shall be feathered to provide a smooth pathway for foot traffic. The pavement shall be protected from traffic until thoroughly cooled and set. Hot mix asphalt rolled gutters shall be compacted as directed by the Engineer as part of the overlay resurfacing work and no additional payment will be made therefor.

n. Any rollers shall be equipped with pads and water systems that prevent sticking of asphalt mixtures to the steel-tired wheels. A parting agent, which will not damage the asphalt mixture, as determined by the Engineer, may be used to aid in preventing the sticking of the mixture to the wheels.

o. The finished surface shall be cat-tracked within 24 hours of completion of paving work. Final striping shall be applied within one week of completion of paving work.

3. Field Quality Control

   a. The Contractor shall control the quality of the work and shall provide adequate testing to assure compliance with these Specifications.

   b. After completion of paving work, all paving shall be inspected. Any resulting “ponds” shall be ringed with chalk. Such hollows shall be corrected with addition of asphalt paving materials and rerolling until all paving is completely level and free from hollows and high spots.

   c. As part of its quality control program, Contractor shall employ a competent qualified testing subcontractor to perform in-place density and compaction tests of the completed pavement in accordance with California Test 375 to determine compliance with specified requirements. A minimum of: three (3) tests shall be performed at each conform paving location (i.e., paving around new sidewalk/curb ramp), six (6) tests on the overlay at the fire lane (between Berkeley Way and University Avenue), and/or as directed by the Engineer to verify compliance. Contractor shall provide all test results to the Engineer by the end of the next business day.

1.05 MEASUREMENT AND PAYMENT

Full compensation for providing “Hot Mix Asphalt (Type A)” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing hot mix asphalt, applying binder, testing, complete in place as shown on the Plans, as specified in the Standard Specifications and these Specifications, and as directed by the Engineer and shall be considered as included in the contract prices for the Concrete Curb and Gutter and no additional compensation will be made therefor.

CONCRETE PAVING 32 1313

1.01 GENERAL

Concrete sidewalk shall conform to Section 73 “Concrete Curbs and Sidewalks” of the State Standard Specifications, as modified in the Plans, these Specifications and as directed by the Engineer. All Work shall be done to the satisfaction of the Engineer and all subgrade shall meet the acceptance of the designated representative of the Geotechnical Engineer.

Damage to the street, sidewalk, curbs and gutters from construction activities shall be repaired to the satisfaction of the City Engineer.

1.02 SUBMITTALS

The Contractor shall submit the concrete mix design and strength data to the Engineer for favorable review.

Supplier's certificates showing conformance with this specification shall be delivered to the Engineer with each shipment of materials delivered to the job site.

1.03 MATERIALS

1. Portland Cement Concrete for fixed form concrete surface improvements shall be minor concrete conforming to the requirements of Section 90-2 “Minor Concrete” of the Standard Specifications with at least 505 pounds of cementitious material per cubic yard and 1-inch maximum graded coarse aggregate. No bagged mix is permitted. Hand mixing of Portland Cement Concrete for use in concrete surface improvements shall not be permitted. For concrete paving subjected to vehicular traffic, strength of concrete in place shall be 4,000 psi at 28 days. For concrete paving not subjected to vehicular traffic, strength of concrete in place shall be 3,000 psi at 28 days. No admixtures shall be used without approval of the Engineer.

   Maximum slump of fresh concrete permitted in these items shall be 4 inches. Slump shall be determined by either ASTM C-143 or California Test Method No. 520 at the Engineer’s discretion.

2. Concrete curb shall be secured by No. 4 reinforcing bars grouted vertically with Class "B" mortar into holes drilled into the pavement at a spacing not greater than 4 feet on centers measured along the centerline of the curb. Such bars shall be 10 inches long and the holes therefore 6 inches deep. The Contractor shall reinforce the curb longitudinally with a continuous No. 4 bar seated one inch below the top of the vertical reinforcing and tied to it with no. 14 wire.

3. Aggregate base shall be Class 2, 3/4" maximum. When the aggregate base is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the area to be covered with aggregate base.

4. Dowels, where noted or called for on the Plans or detail drawings, shall be smooth billet-steel bars conforming to the requirements of ASTM Designation A615 for Grade 40 bars.

5. Tie wire for reinforcement shall be eighteen (18) gauge or heavier black annealed conforming to the requirements of ASTM Designation A82.

1.04 EXECUTION

Formwork

a. Prior to forming for concrete surface improvements, the Contractor shall pass the compaction test for the subgrade from the Geotechnical Engineer.

b. Forms for concrete surface improvements shall be subject to the approval of the Engineer. No concrete shall be placed prior to Contractor obtaining such approval.

c. Forms for concrete surface improvements shall have a smooth and true upper edge and the side of the form to be placed next to concrete shall have a smooth finish. Forms shall be constructed rigid enough to withstand the pressure of the fresh concrete to be placed without any distortion.

d. All forms shall have been thoroughly cleaned prior to placement and shall be coated with an approved form oil sufficient to prevent adherence of concrete prior to filling.

e. Forms shall be carefully set to the alignment and grade required by the Plans. Forms shall be rigidly held in place by stakes set at intervals satisfactory to the Engineer. Sufficient clamps, spreaders and braces shall be installed to ensure the rigidity of the forms.

f. Forms for surface slabs shall be equal to the full depth of the concrete as shown, noted or called for on the Plans or detail drawings. Composite forms made up from benders or thin planks of sufficient ply to ensure rigidity of the form in the shape required may be used on curves and curb returns.

g. Concrete pads shall have forms removed and be backfilled within 3 days after pouring.

Concrete Placement

a. Where a portion of existing concrete surface improvements is to be reconstructed, the section to be removed shall first be separated from that to remain by means of a cut with an approved concrete saw to a minimum depth of one and one-half (1-1/2) inches at the first score line beyond the area to be replaced.

b. All repairs to concrete surface improvements shall be made by completely removing and replacing the entire portion between the score lines or joints.

c. Prior to subgrade work and concrete placement, all debris and trash will be removed from all areas related to this work. Existing subgrade surface shall be re-graded (if necessary) and re-compacted to conform to the grades shown on the Plans.

d. Any concrete discolored, defaced, or otherwise damaged before official acceptance shall be cleaned, repaired or replaced at the Contractor's expense.

e. If existing utilities are found to interfere with the permanent facilities being constructed under this Contract, immediately notify the Engineer and secure instructions. Do not proceed with permanent relocation of utilities until written instructions are received from the Civil Engineer.

f. Contractor shall accurately grade and prepare the site to the lines and grades called for on the Plans and detail drawings with due provision for future surface improvements.

g. Surface tolerance: Finished paving surfaces shall not vary more than 1/4 inch measured with a 10-foot metal straight edge, except at grade changes. No birdbaths or other surface irregularities will be permitted. Correct irregularities to the satisfaction of the Engineer without additional cost to the project.

h. Concrete shall be transported in truck mixers or agitators and discharged with 70 minutes of leaving the plant.

i. All new concrete pads adjacent to existing concrete pavement shall be dowelled to the existing concrete. The dowels shall be #4 rebar, 18 inches long at 18 inches maximum spacing. Dowels shall be embedded a minimum of 8-inches in a 5/8-inch drilled hole (existing concrete).

j. Concrete pads shall be given a median broom finish. The surface shall first be given a floated finish and final troweling shall be done with a steel trowel. The finished surface shall be free of all trowel marks and shall be uniform in texture and appearance. Broom texture shall be in the longitudinal direction.

k. New concrete work shall match existing in finish, score pattern, and color, or as shown on the Plans, or as directed by the Engineer.

Joints

a. Expansion joints incorporating premolded joint fillers for fixed form concrete surface improvements shall be constructed at sixteen (16) foot intervals or as appropriate to match existing pattern and at the ends of curb returns. Expansion joint filler strip shall be an approved one piece premolded ½" thick strip conforming to the requirements of ASTM Designation D1751 or ASTM D 994. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated. Expansion joint material shall be shaped to fit the cross section of the concrete prior to being placed.

b. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: Joint sealant shall conform to ASTM D 5893, Type SL. Install per manufacturer's guidelines.

c. Scoring pattern and weakened plane joints (deep joints) shall be as indicated in the Plans and approved by the Engineer.

Testing

Slump tests shall be performed by the General Contractor in the presence of the Engineer at the beginning of each day's pour and at such additional times as required by the District. Slump tests shall be made in accordance with current ASTM Designation C-143 or California Test Method No. 520 at the Engineer's discretion.

The Contractor shall hire an accredited materials testing laboratory to perform Quality Control tasks, including slump tests and compressive strength (per ASTM C39/C39M) tests. The Contractor shall sample and test (3) cylinders or as directed by the Engineer:

Inspection

a. The Engineer shall inspect and approve formwork and reinforcing steel placement prior to concrete pours. The General Contractor shall provide at least 24 hours' notice that inspections are required.

1.05 MEASUREMENT AND PAYMENT

The contract price paid per square foot for "Concrete Flatwork" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in placing concrete, complete in place, including, excavation, subgrade preparation, placement of Class II aggregate base, forming work, testing, and finishing, as shown on the Plans, and specified herein, and as directed by the Engineer.

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WHEEL STOP 32 1713

1.01 GENERAL

Specifications for furnishing and installing precast concrete parking bumpers (wheel stops) as indicated.

1.02 SUBMITTALS

Contractor shall provide submittal for each Respective manufacturer's product data for manufactured products.

1.03 MATERIALS

- APC Model CB06 precast concrete wheel stop (6' length) or an Engineer approved equal. Provide anchors per manufacturer's recommendations or as approved by the Engineer.

1.04 MEASUREMENT AND PAYMENT

The contract price paid for each "Wheel Stop" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work complete in place as shown in the Plans, as specified in the State Standard Specifications and these Specifications, and as directed by the Engineer.

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PAVEMENT DELINEATION 32 1723

1.01 GENERAL

Specifications for providing paint as indicated.

1.02 SUBMITTALS

Contractor shall submit shop drawings and diagrams, indicating location, color, and dimensions of parking stall paint.

1.03 MATERIALS

1. Paint shall conform to the requirements in ASTM Designation: D 6628-01.
2. Retroreflectivity of the paint traffic stripes and pavement markings shall conform to the requirements in ASTM Designation: E 1710.
3. Paint type shall be Waterborne Traffic Line conforming to the requirements of Federal Specification TT-P-1952E.

   All work shall be performed in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the State Standard Specifications and these Specifications at the locations shown on the Plans and as directed by the Engineer.

1.04 EXECUTION

1. Application shall consist of two separate coats of traffic paint of the appropriate color.
2. Nothing in these Specifications shall relieve the Contractor from their responsibilities as provided in Section 7-1.09, “Public Safety,” of the State Standard Specifications.

1.05 MEASUREMENT AND PAYMENT

The contract lump sum price paid for “Pavement Delineation” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work complete in place as shown in the Plans, as specified in the State Standard Specifications and these Specifications, and as directed by the Engineer.

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SECTION 32 31 00

STEEL FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel-framed fences with expanded-metal infill, modified from existing.
2. Swing gates, modified from existing.

B. Related Requirements:

1. Section 10 14 23 "Panel Signage" for signage attached to fences and gates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Fence and gate posts, rails, and fittings, to extent new members are required.
b. Expanded-metal infill, reinforcements, and attachments.
c. Gates and hardware.

B. Shop Drawings: For each type of fence and gate assembly to be modified for the Project.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.5 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to comply with performance requirements.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Operating Force: Gates shall comply with CBC and ADA accessibility requirements for initial opening force, operating force, and time to close.

2.2 STEEL EXPANDED-METAL INFILL

A. General: Provide infill in one-piece heights measured between top and bottom of outer edge of top and bottom rails, and requirements indicated below:

1. Pattern, Thickness, and Material: Match existing galvanized and rolled expanded metal.

2.3 FENCE FRAMEWORK

A. Posts and Rails: Match existing, to extent new components are required for the Work. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: Match existing..
2. Light-Industrial-Strength Material: Group IC-L, round steel pipe, electric-resistance-welded pipe.
3. Horizontal Framework Members: Intermediate, top, and bottom rails according to ASTM F 1043.
4. Metallic Coating for Steel Framework: Match existing, selected from the following.

a. Type A: Not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating according to ASTM A 123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating according to ASTM A 653/A 653M.
b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- (0.0076-mm-) thick, zinc-pigmented coating.
d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) coating.

2.4 SWING GATES

A. General: ASTM F 900 for gate posts and single swing gate types.

1. Gate Leaf Width: Match existing, except minimum 36 inches (914 mm).
2. Framework Member Sizes and Strength: Based on gate fabric height matching existing.

B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
2. Gate Posts: Round tubular steel or rectangular tubular steel.
3. Gate Frames and Bracing: Round tubular steel or rectangular tubular steel.

C. Frame Corner Construction: Welded.

D. Hardware:

1. Hinges: 180-degree outward swing.
2. Exit Device: Lever entrance and panic-bar egress, rated for exterior use.
3. Lever Lockset: Lever entrance and exit, rated for exterior use.

    a. Access Control: Existing, to remain, at lever entrance and exit condition. Provide new electric strike if required to coordinate with new hardware.

4. Closer: Overhead closer, adjustable for accessible operation and rated for exterior use.
5. Latch Guard: Provide unperforated galvanized steel sheet-metal guard, in configuration indicated in Drawings.

2.5 FITTINGS

A. Provide fittings according to ASTM F 626; match existing.

B. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. (366 g/sq. m) of zinc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FENCE INSTALLATION

A. Install new and reinstalled fencing according to ASTM F 567 and more stringent requirements specified.

B. Post Setting: Set posts in concrete at indicated spacing.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

    a. Posts Set into Holes in Concrete: Form or core drill holes not less than 5 inches (127 mm) deep and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.

C. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet (152 m), space pull posts an equal distance between corner or end posts.

D. Line Posts: Space line posts uniformly at maximum 10 feet (3 m) o.c.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at midheight of fabric 72 inches (1830 mm) or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

G. Intermediate and Bottom Rails: Secure to posts with fittings.

H. Expanded-Metal Infill: Apply fabric to same face of enclosing framework as existing fencing. Anchor to framework to match existing.

3.3 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach infill as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.4 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train City's maintenance personnel to adjust, operate, and maintain fences and gates.

END OF SECTION

WOODEN HEADER 32 9413

1.01 GENERAL

Specifications for furnishing and installing wooden header as indicated in the plans.

1.02 SUBMITTALS

Contractor shall provide submittal for each Respective manufacturer's product data for manufactured products.

1.03 MATERIALS

1. Wooden headers shall be con heart redwood.
2. Metal fasteners shall be high quality Class G-185 hot dipped galvanized (ASTM A153 OR A653), 304 or 316 stainless steel, or other acceptable corrosion resistant material. All cuts, holes, and injuries (such as abrasions and nail holes) shall be field treated with applications of preservatives in accordance with AWPA Standard M4.

1.04 MEASUREMENT AND PAYMENT

The contract lump sum price paid for "Wooden Header" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work complete in place as shown in the Plans, as specified in the State Standard Specifications and these Specifications, and as directed by the Engineer.

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SITE WATER DISTRIBUTION SYSTEM 33 1116

1.01 GENERAL

Specifications for providing fire water service and distribution and modification to existing water main as indicated. The extent of water distribution is indicated on the Contract Drawings and includes furnishing, installing, testing, and disinfecting permanent water supply piping and services as indicated.

1.02 SUBMITTALS

Contractor shall provide submittal for each Respective manufacturer's product data for manufactured products.

1.03 MATERIALS

1. Piping: AWWA C151, thickness Class 50.
   - Fittings: AWWA C110.
   - Joints: Field Lok gaskets as manufactured by US Pipe, or equal.
   - Provide inside pipe and fittings with 1/16 inch thick cement-mortar lining and an asphaltic seal coat in accordance with AWWA C104.
2. Backflow Prevention Device - Device shall be approved by EBMUD and installed per EBMUD Standard Plan 1931-A-1 or as directed by the Engineer. As a minimum, backflow preventer shall be a reduced pressure principle assembly with two rising stem gate shut-off valves, two resilient seat ball-valve test cocks, and two replaceable resilient seat check valves. Backflow preventer shall be suitable for 175 psig operating pressure and 140 degrees F operating temperature and shall be of bronze construction with screwed inlet and outlet for 1.5 inch and smaller sizes and cast iron, epoxy coated construction with 150 pound flanged inlet and outlet for 1.5 inch and larger sizes. (AWWA C510 and C511). Paint complete (above ground) backflow assembly "black" or as approved by the Engineer. Install device in tamper-proof cage per EBMUD Standard Plan 9498-GB.
3. Gate Valves: 150 pound bronze, non-rising stem, wedge disc, threaded connection, conforming with MSS SP-80. (AWWA C509 and AWWA C550)
4. Fire Department Connections – Shall be as indicated in contract plans and comply with jurisdictional water utility district.
5. Concrete Thrust Blocks - Provide Class 3000, 3/4 inch aggregate, concrete for all thrust blocks, with reinforcement where indicated or required.
6. Exposed Metal - All exposed iron/metal (bends, bolts, glands, rings) shall be wrapped with six inch pipe wrap (tape coat HD 30).

1.04 EXECUTION

Make water service connections, as indicated, in accordance with California Plumbing Code and the installation instructions of the service pipe and fittings manufacturer.

Maintain water service and conduct operations at times selected to minimize duration and inconvenience of service interruption. Water valves in service owned by EBMUD shall be operated only by personnel of that jurisdictional water utility district.

<u>INSTALLATION</u>

1. Specifications for excavating, backfilling and compacting for the installation of pipe shall be per City of Berkeley Standard Plan 8136 and as modified by these specifications.

2. Install piping true to line and grade, supported and guided to assure alignment under all conditions.

3. Make change in line with fittings. Do not spring joints to effect change of direction.

4. Do not field cut pipe unless necessary. Make such necessary cuts by means of equipment designed for the purpose, ensuring a smooth square end.

5. For connection to existing pipe, provide pipe with suitable ends or adapters, after verification of size and type of existing pipe.

VALVES

1. Install unions at each connection to valves.

2. Install valves in accordance with the valve manufacturer's installation instructions.

3. Where valves are provided by the jurisdictional water utility Owner, provide suitable access for operation of valves.

TESTS

1. Protection from Flooding - Provide positive measures to protect exposed, installed pipe and compacted pipe bedding from flooding during testing.

2. Notice of Testing
   a. Give three (3) days notice of intention of testing to the Engineer and jurisdictional agency. The Contractor will furnish, install, and operate pumps, gages, meters, and individual pipe connections to test openings.
   b. Designate largest sections feasible for testing and sterilizing.

3. Testing Requirements
   a. Prior to backfilling, isolate system by use of approved valves, caps and plugs, or other means.
   b. Maintain such isolation throughout the performance of leakage and pressure testing.
   c. Where valves are used for isolation, eliminate leakage through such valves if it occurs. Maintain new work isolated from existing water mains, except for test connections, until testing and sterilization have been completed.
   d. For hydrostatic tests, provide approved caps and plugs in sections to be tested and remove them after testing.
   e. Prevent leakage in pipes and fittings at openings. Temporarily block plugged and capped ends to prevent displacement.
   f. Install water source connection for testing, as directed.
   g. Provide labor and materials required for leakage testing, including excavation for installation and removal of pumps, gages, meters, and water source connections.
   h. Where leakage exceeds the Owner's standards, perform necessary corrective measures.
   i. Remove and replace defective pipes, joints, fittings, valves and appurtenances. Reset such items if displaced.

4. Hydrostatic Tests
   a. Perform hydrostatic tests in accordance with the Owner's requirements. All such tests shall be witnessed by the representative. The Contractor shall be responsible for making all such arrangements.

b. Test the potable water system hydrostatically in sections to a pressure of at least 150 psi for not less than 15 minutes. Pressure test pipe before backfilling. Repair leaks and retest the system until the system is leak free. Use instruments calibrated by a quality laboratory. Test sequence shall be as follows:

   i. Lines shall be fully flushed.
   ii. Lines shall be hydrostatically tested.
   iii. Lines shall be fully flushed.
   iv. Lines shall be fully disinfected.

SYSTEM DISINFECTION

1. Standard Disinfection Procedure For Domestic Water System

   a. Supervision and Testing: Perform entire disinfection procedure under the supervision of Engineer. Provide five (5) days' notice to schedule procedure.
   b. Contractor's Responsibility: Furnish a copy of the California Department of Pesticide Regulation (DPR) Qualified Applicator License, equipment, materials and transportation to disinfect domestic hot and cold water systems and fire lines directly connected thereto, in conformity with procedures and standards described herein.
   c. Disinfecting Agent: An aqueous solution of sodium hypochlorite (minimum 5.25% available chlorine). The use of powdered hypochlorite and chlorine gas are prohibited unless specifically approved by the Engineer.
   d. Preliminary Preparations:
      i. Service Cock: Provide within three feet (3'-0") of the entrance of the supply main to the building, a three-quarter inch (3/4") service cock, or valve, for the purpose of introducing the disinfecting agent.
      ii. Flushing: After final pressure tests and before draining for disinfection, open each fixture or outlet until the water flow is clear.
   e. Disinfection Procedure:
      i. Drain entire domestic water system including fire line.
      ii. Post suitable warning signs at each outlet: Warning - Do Not Use - Water System Being Chlorinated.
      iii. Inject disinfectant solution into the system through the service cock by means of a pump, or other pressure device, at a slow continuous rate, simultaneous with a reduced flow from the water main, until the Ortho-Tolidin test for residual chlorine at each outlet shows a concentration of at least 50 ppm, but note more than 100 ppm.
      iv. Close all outlets and valves, including the service valve at the main and the injection cock. Retain the chlorinated water in the system for 24 hours.
      v. After the 24 hour holding period, the residual chlorine concentration shall be not less than 50 ppm as shown by the Ortho-Tolidin test.
      vi. Drain and flush entire domestic water system until Ortho-Tolidin tests show background residual chlorine concentration at any and all outlets.
      vii. The Engineer shall determine whether samples of water must be collected and analyzed for the determination of bacteriological quality.
   f. Standards Necessary for Approval:
      i. The water system shall have been uniformly chlorinated under the supervision of the Engineer as outlined above.
      ii. The results of water sample analysis shall be negative for the Coliform organisms.
      iii. If the test for the bacteriological quality of the water in the system does not meet the standards, repeat the disinfection procedure until the specified standards are met.

1.05 MEASUREMENT AND PAYMENT

The contract lump sum price paid for “Site Water Distribution” shall include full compensation for furnishing all labor, materials, tools, equipment, trenching, backfilling, supervision, and incidentals and for doing all the work involved as indicated in the plans, specified in the State Standard Specifications and these Specifications, and as directed by the Engineer as may be required to complete the work.

APPENDIX A

SCOPE OF SECURITY AND PATROL SERVICES

ARTICLE 1 – GENERAL CONDITIONS

1.01 GENERAL REQUIREMENTS

A. Licenses and Permits:

1. Subcontractor(s) must have all necessary licenses to operate in the State of California ("State"). Licenses must be current and valid, and in good standing with the State.

2. Security guard force shall be composed of guards with a valid security guard registration and license with the California Department of Consumer Affairs, Bureau of Security and Investigative Services. Upon request by City of Berkeley staff, guards shall provide a copy of their current valid guard registration card, issued by the California Department of Consumer Affairs, Bureau of Security and Investigative Services.

B. Equipment:

Subcontractor(s) shall provide all labor, transportation, materials, and equipment to perform the security services described herein. Equipment shall include, but not be limited to, uniforms, vehicles, radios and cell phones, Guard Tour Patrol Systems, security handbook, visitor logs, incident report forms, and any other equipment necessary to perform the services described, including additional services of the same general nature as requested by the City. The City shall have a right to inspect any material to be used in the performance of the services pertaining to this Contract.

Equipment provided must be relevant to each specific Scope of Services as not all location sites require vehicles, uniforms, Guard Tour Patrol Systems and visitor logs.

1. Uniforms shall include, at minimum, Subcontractor's insignia, nametag, unique identification number, and picture of the employee.

2. Vehicles shall be in good operational condition to perform the mobile vehicle patrol, including maintenance and fuel. All vehicles must exhibit company name, logo, and utilize a roof mounted strobe beacon light. At its discretion, the City may require that a removable City logo be attached to all vehicles assigned to use on this Contract. Subcontractor shall have the capability to temporarily replace vehicles as needed due to accidents or malfunctions within a reasonable time frame at all times.

3. Subcontractor shall operate a twenty-four/seven (24/7) security operation center and assign personnel equipped with cell phones and radios capable to communicate with the security operation center at all times.

4. Subcontractor shall maintain Guard Tour Patrol Systems at work sites where patrols are required to be performed at regular time intervals or at any other location as deemed necessary by the City. The Guard Tour Patrol Systems shall ensure City's Project Managers or designated personnel that guards execute patrols and accomplish assigned tasks within predefined time intervals. Locations of Guard Tour checkpoints shall be confirmed with City's designated representative prior to commencement of security and patrol services.

5. A Security Handbook shall be distributed to each guard assigned to the City and to each City's Project Manager or designated personnel. The Security Handbook shall include a description of duties, maps of the area(s), City's relevant contacts, evacuation plans,

emergency drill procedures, visitor acceptance protocol, incident reporting, response instructions, and other pertinent operating procedures. In accordance with the City's EPP, electronic/digital forms of the Security Handbook are acceptable; paper versions shall be available to the City's Project Managers or designated personnel upon request. Security guards must be able to access the Security Handbook at any time; the City will not make available digital readers/equipment and/or personal computers for Subcontractor use.

6. Visitor Logs shall include date, time visitor arrived/departed, visitor name, visitor entity/company affiliation, visitor or entity/company's telephone number and e-mail. Subcontractor(s) shall establish and dispense to guards on duty a complete set of written visitor procedures. Visitor Logs must be archived and made available upon request during the entire contract execution period and for three (3) years after termination of the Contract. In accordance with the City's EPP, electronic/digital forms of Visitor Logs are acceptable, with paper versions available to the City's Project Managers or designated personnel upon request. Security guards must be able to access and compile Visitor Logs at any time; the City will not make available digital readers/equipment and/or personal computers for Subcontractor use.

7. Incident Reports shall specify time and location of incidents, name of individuals involved, including Subcontractor and City staff, description of incidents, and actions taken. Incident Reports shall be submitted to the City within twenty-four (24) hours of the occurrence of an incident and must be retained for the entire contract execution period and for three (3) years after termination of the Contract. In accordance with the City's EPP, electronic/digital forms of Incident Reports are acceptable, with paper versions available to the City's Project Managers or designated personnel upon request. Security guards must be able to access and compile Incident Reports at any time; the City will not make available digital readers/equipment and/or personal computers for Subcontractor use.

1.02 STAFFING REQUIREMENTS

A. Subcontractor shall allocate an Account Manager to the City of Berkeley. The Account Manager will function as the single point of contact for the City and he or she will oversee contract implementation, address the City's needs and ensure City's requirements are met. At least once every three (3) months the Account Manager will provide City's Project Managers, or their assigned designee(s), with activity reports that specify, inter alia: number of patrols, number of incidents, onsite supervision and inspections carried out, training. provided, operating procedures updates, duties updates, key performance indicators and performance metrics. The Account Manager shall have prior security experience, know and understand relevant aspects of the security business, and be cognizant of local government contexts.

B. Security guards assigned to the Contract shall be able to speak, read, write, and understand the English language. Guards must be able to communicate with the public, read signs, report emergencies, and write clear and legible incident reports in the English language. High school diploma or General Education Development Certificate (G.E.D.) are desirable credentials. Security guards must possess a current valid registration card issued by the California Department of Consumer Affairs, Bureau of Security and Investigative Services; it is presumed by assignment to this Contract that guards are cleared by the California Department of Justice. In all cases, personnel deployed at the City must undergo a background check with the California Department of Justice. The cost of all background checks is borne by the Subcontractor.

C. Subcontractor's assigned guard staff must be physically and mentally fit to perform the services under this Contract. Guards shall be mentally alert, think in coherent and goal directed fashion, exercise good judgment and are able to make decisions and implement actions to safeguard themselves and others. Guards must be able to follow instructions and assimilate training specific to their duties.

D. Security guards assigned to the City shall dress and groom in accordance with accepted professional and business standards. Guards shall not lean against walls, stand with their hands in their pockets, use cellular phones or similar devices for non-work related purposes or adopt unprofessional conduct and posture.

E. Upon Contract execution or any subsequent change in personnel the Subcontractor(s) shall provide notice to the City's Project Managers, or assigned designee(s), the names of security officers to be assigned at each location. The City reserves the right to decline any assignment/change in its sole discretion and this decision shall be final and not subject to appeal. On request, the City will provide a written statement to the Subcontractor within ten (10) business days documenting the reason for any such determination.

1.03 OPERATIONAL REQUIREMENTS

A. The Subcontractor shall maintain a twenty-four hours per day/seven days per week (24/7) communication center which will support assigned personnel deployed at the City. Assistance will include, but not be limited to, event analysis, triage of events, identification of best responses, and event recording.

B. Security guards shall not work more than twelve (12) hours in any twenty-four (24) hours period. The Subcontractor shall guarantee service continuity during meal breaks and rest periods of assigned personnel.

C. The Subcontractor shall conduct regular systematic inspection of their staff, and shall be responsible for providing adequate supervision to ensure competent and satisfactory performance of the services required under this Contract. The Subcontractor shall provide the City with a synopsis of supervision activities every three (3) months.

D. City's Project Managers, or assigned designee(s), may periodically inspect work performance of assigned guard personnel and notify the Account Manager via e-mail of any discrepancies, concerns, or unsatisfactory execution of duties.

E. The Subcontractor shall be readily available to replace absent, late, or discontinued security officers and shall notify the City of such late substitutions in advance of a shift.

F. The City reserves the right to require the prompt removal and replacement of any security guard it determines, in its sole discretion to be unacceptable for any reason. The City's determination of unacceptability shall be final and not subject to appeal. On request, the City will provide a written statement to the Subcontractor within ten (10) business days documenting the reason for any such determination.

G. City's Project Managers, or assigned designee(s), will notify the Subcontractor in writing about failure to perform, shortcomings, or any other matter related to Contract(s)' execution. The Subcontractor shall respond to all received written notifications and, if necessary, redress deficiencies as soon as possible but not later than three (3) business days. Failure to remedy unsatisfactory performance may be grounds for contract termination.

H. The City may require additional scheduled and non-scheduled services at its discretion. City's Project Managers, or assigned designee(s), will notify Subcontractor's as soon as possible if additional needs arise. The Subcontractor is expected to provide additional guard services upon twenty-four (24) hours or more notice unless otherwise agreed. The additional services maximum rate is established by the applicable hourly rate as indicated in Paragraph F, "Compensation for Services." In cases of material variance to the Scope of Services, the City reserves the right to negotiate a lower hourly rate or a lump sum payment.

I. Service reduction: The City at its discretion may adjust the Subcontractor's days and/or hours of service up to full termination of service at either a specific facility or all facilities. The City will notify the Subcontractor of the adjusted schedules/termination of service(s) within a reasonable time frame. The Subcontractor agrees that a reduction in service shall be also reflected in a reduction of the price as stipulated in Paragraph F, "Compensation for Services." The reduction in price shall be calculated by multiplying the hourly rate per guard by the number of assigned hours per guard by the number of guards relieved from service.

J. In the event of any breach of the City's property and any City security or law violation, the Subcontractor agree to have an established set of procedures for responding and reporting that is applicable to all guards. These procedures shall be included in the Security Handbook and distributed to all security officers and to City's Project Managers or assigned designees. Procedures are to describe circumstances, conditions, degree, measure, and manner in which responses must be applied and at minimum include procedures:

- to investigate unusual or suspicious conditions or activities;
- to prevent trespass, damage, or theft of City's property;
- to prevent harm to City's personnel and or general public;
- to enforce security regulations;
- to assist with crowd flow;
- to report unsafe or dangerous conditions;
- to report incidents, security or law violations;
- to manage communication flow with the twenty-four/seven (24/7) security operation center; and
- to cooperate with City of Berkeley law enforcement and emergency services officers and personnel.

1.04 CITY HOLIDAYS AND VTO DAYS

A. The City recognizes thirteen holidays per year and assigns one Friday per month, generally the second Friday of each month, as a Voluntary Time Off ("VTO") day.

1. New Year's Day
2. Martin Luther King Jr.' s Birthday
3. Abraham Lincoln's Birthday
4. President's Birthday
5. Malcolm X's Birthday
6. Memorial Day
7. Juneteenth
8. Independence Day
9. Labor Day
10. Indigenous Peoples' Day
11. Veteran's Day
12. Thanksgiving Day/Day after Thanksgiving
13. Christmas Day

B. City holidays are included in the scope of services and 24-hour coverage on City holidays is required.

1.05 COMPENSATION FOR SERVICES

A. Fee for security and patrol services shall be included in the Contract Sum on the Bid Form as an Allowance. See Documents 00 4113 Bid Form, 01 1100 Summary of Work, and 01 2000 Measurement and Payment of the Contract Documents.

B. In the event additional services or reduction in services are required, the maximum rate is established by the applicable hourly rate as indicated below.

Hourly Rate
$30.54

C. Invoices: Invoices must be fully itemized, and provide sufficient information for approving payment and audit. Invoices must include service location, description of services provided, period covered; and the invoice must be numbered and dated in order to be processed. Invoices for security and patrol services are to be submitted by Prime Contractor to City with Applications for Payment.

ARTICLE 2 – 1601 SECOND STREET PATHWAYS STAIR CENTER

1.06 MINIMUM NUMBER OF SECURITY GUARDS

A. One (1) for each shift

1.07 DURATION

A. The scope of security and patrol services shall begin upon Prime Contractor’s possession of the site following Commencement of Work and end upon City’s occupation of the site following Substantial Completion.

1.08 WORK SCHEDULE

A. Work schedule shall be as follows:

- Monday through Friday between 4:00 p.m. and 8:00 a.m.
- Saturday 8:00 a.m. through Monday 8:00 a.m. (48 hours of coverage)
- **City holidays are included and 24-hour coverage is required on City holidays**

B. The City may require additional services on an “as-needed basis” and these services will be charged separately at the applicable hourly rate.

1.09 DAILY SERVICES

A. Be a visible presence in the site and at entrance gates

B. Monitor access areas at pedestrian and vehicle entrances, and using a sign in and out sheet authorize entrance and departure of City’s employees, visitors, and contractors. Prime contractor to maintain and provide list of authorized entrants to security subcontractor.

C. Conduct hourly patrols around the perimeter of the site to deter trespassing, detect signs of intrusion, theft, suspicious or illegal occurrences, and unsafe or dangerous circumstances.

D. Check perimeter fences and trailers for signs of forced entry or intrusion.

E. Record and collect evidence (e.g. target plates if available, pictures, videos, descriptions, etc.) of suspicious or illegal occurrences.

F. In the event of an emergency or perceived danger, guards are instructed to immediately call 911. Emergency events involving Police or Fire shall be reported to the Subcontractor’s on-duty supervisor and City’s designated personnel at the time of 911 call.

G. In the case of a non-emergency event, guards are instructed to telephone Berkeley Police at 510-981-5900 (for non-emergency calls) and log the event to the daily summary report.

H. Ensure the security, safety, and well-being of all personnel, visitors, and City’s property.

I. Report any unsafe or dangerous condition or circumstance to the City’s designated personnel.

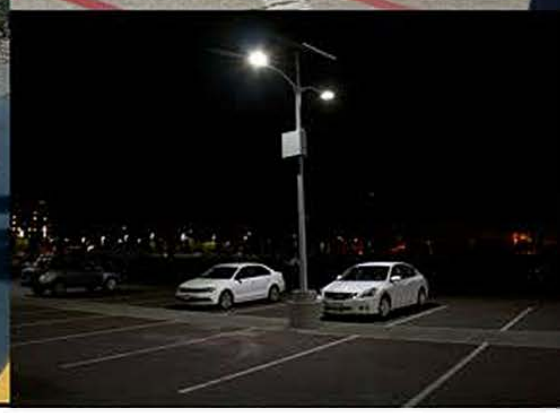
J. Respond to emergencies to provide necessary assistance to employees and visitors.

K. Complete and submit a daily report via email at the end of every shift to City designated personnel. The report should include observations, information, occurrences, and surveillance activities. Highlight noteworthy situations at the top of the daily summary report.

L. Perform ad hoc services of the same general nature as requested by the City.

END OF DOCUMENT

Appendix B - Owner Specified Pole Mounted Lighting



BRIGHTA

Cost Effective Solar Lighting Solutions

SCL NORTH
www.sclnorth.com

Represented by:
SCL-North
805.548.0200 (office)

Greenshine

Brighta series

Greenshine
+1-949-609-9636
sales@streetlights-solar.com
www.streetlights-solar.com

General Specifications

Light Fixture *(GS-LED-260-30W)*

Luminaire input voltage	12 V
Power consumption	30 W
Lumen	2952 lumens
Color temperature	4500-5500K
IES lighting type	Type II
Material	Die-cast aluminum

Solar Panel

Rating Power	150 W
Maximum Power Voltage	18.72 V
Maximum Power Current	8.01 A
Open Circuit Voltage	22.4 V
Short Circuit Current	8.61 A
Size	58.5" x 27"
Weight	39.5 lb

Battery

Battery type	GEL Deep cycle lead-acid
Operating voltage	12 V
Capacity	120 Ah at 20 hr-rate to 1.75 V per cell at 77°F
Dimensions	16(L)×7(W)×9.2(H) (in)
Expected life	5 ~ 7 years

Solar Charger

Operating Voltage	12 V/24 V auto recognition
Max. charge/ load current	5 A/ 10 A/ 20 A (different models)
Night/day detection	2.5 V – 10 V
IP class	IP68

Pole

Height	20 ft.
Diameter	6 3/4” at the bottom, 4” at the top
Thickness	5/32”
Material	Galvanized steel
Finishing	Powder coating

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GS-LED-260 (20W/30W/40W)

- Manufactured according to IEC60598-1:2003
- Advanced thermal management to maximize performance
- 1W optical module Cree LED with individual lenses
- Die-cast aluminum housing
- Electrostatic powder-coated surface for corrosion-resistance and long life
- Glass lens for superior performance
- Suitable for 1-2 lane roads and pathways
- Reduced maintenance
- Optimized roadway distribution

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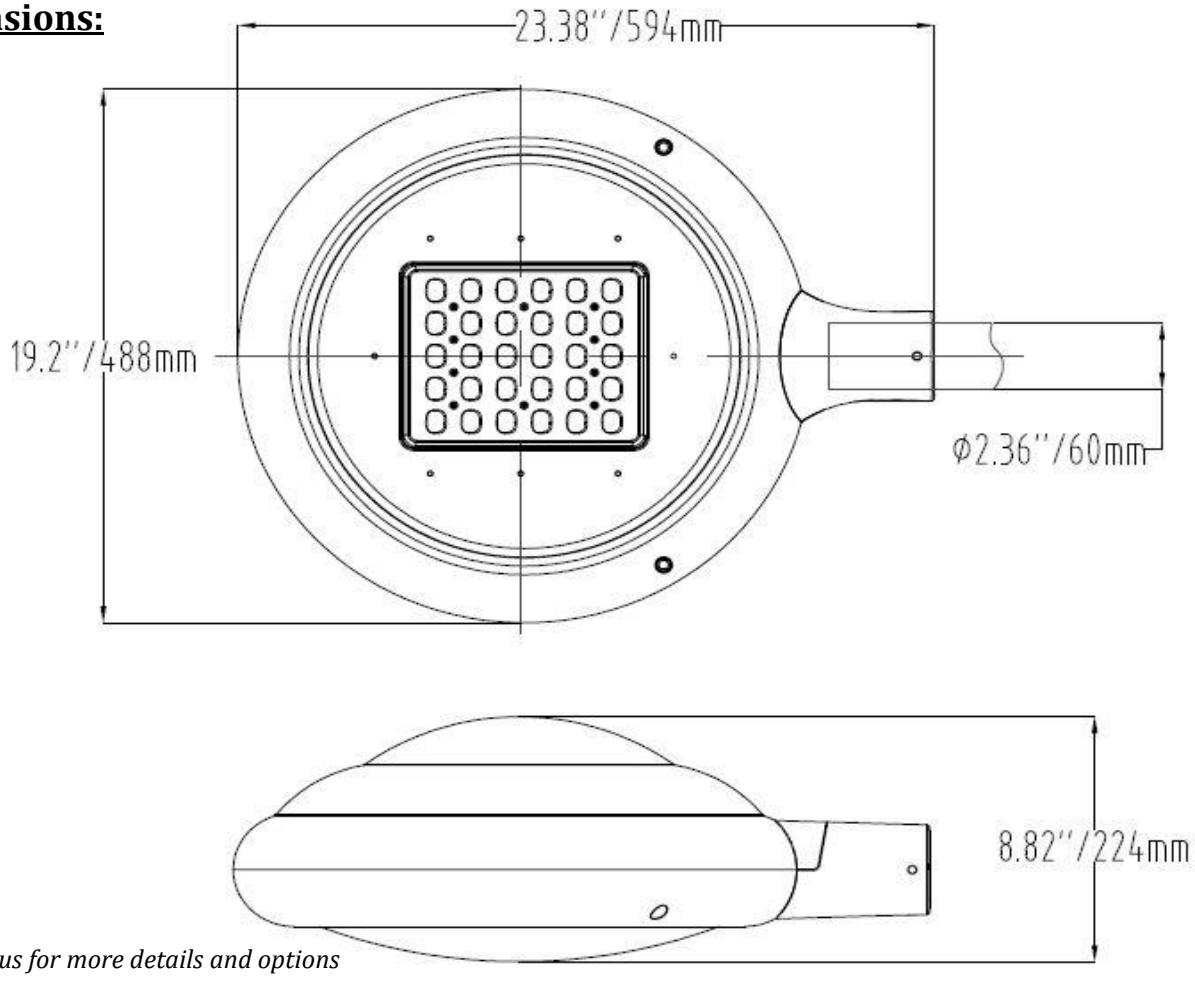
Specifications

Luminaire input voltage	DC 12V/24V
Power consumption	20W/30W/40W
Lumen output	1968/2952/3946 lumens
LED type	CREE XPG, >130 lm/W
Color temperature	4500-5500K
IES lighting type	Type II
Material	High pressure die-cast aluminum
Lens	5mm toughened glass, optical grade PMMA
IP class	IP 65
Insulation	Class I
Operating temperature	-30°C ~+50°C/ -22°F ~+122°F
CRI	≥70

Weight: 8.3 kg/ 18.3 lb.

Dimensions:



** Contact us for more details and options*

Solar panel

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Represented by:
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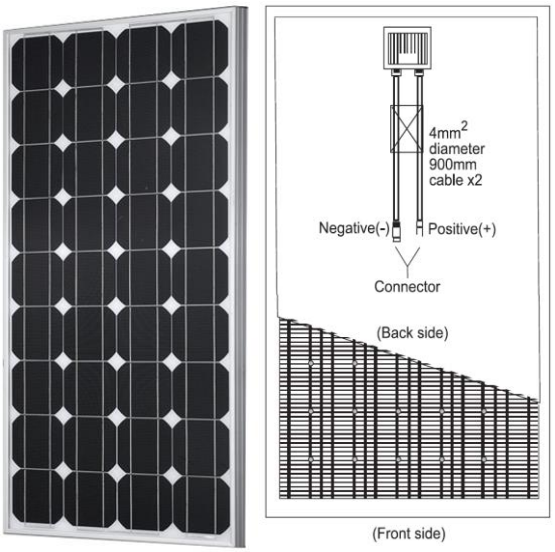
100W / 150W

- Mono-Crystalline solar cells
- Aluminum frame with a unique design to withstand strong winds
- Highly resistant tempered glass
- Multilayer EVA encapsulation with triple layer back sheet
- 25-year power output warranty: 5 years/95%, 12 years/90%, 25 years/80%.



Rating Power	100W	150W
Production Tolerance	± 3%	
Maximum Power Voltage	17.56 V	18.72V
Maximum Power Current	5.72 A	8.01A
Open Circuit Voltage	21.7 V	22.4 V
Short Circuit Current	6.23 A	8.61 A
Frame	Anodized aluminum, 4mm thickness	
Dimensions	1208mm x 682mm 47.5" x 27" 13Kg / 29.5lb	1486mm x 682mm 58.5" x 27" 18Kg / 39.5lb
Test Temperature	25°C / 77°F	
Junction box / Wiring	IP65 Junction box with 900mm cable	

Battery

Greenshine

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Represented by:
SCL-North
805.548.0200 (office)

Greenshine Gel-type Battery

(80Ah – 120Ah – 150Ah – 200Ah)

GEL deep cycle battery with a 12 years floating design life is especially designed for frequent cyclic discharge under extreme temperature.

	GS-GEL-H80	GS-GEL-H120	GS-GEL-H150	GS-GEL-H200
Cells per unit	6			
Voltage per unit	12V			
Capacity	80Ah @ 20hr-rate to 1.75V per cell @ 25°C/ 77°F	120Ah @ 20hr-rate to 1.75V per cell @ 25°C/ 77°F	150Ah @ 20hr-rate to 1.75V per cell @ 25°C/ 77°F	200Ah @ 20hr-rate to 1.75V per cell @ 25°C/ 77°F
Weight	26 kg/ 58 lb.	38 kg/ 84 lb.	46 kg/ 100 lb.	59.2 kg/ 131.5 lb.
Dimensions L x W x H	330×172×214(mm) 13''×7''×8.5''	406×173×233 (mm) 16''×7''×9.2''	483×170×240 (mm) 19''×6.7''×9.5''	522×240×218 (mm) 20.5''×9.44''×8.7''
Max discharge current	800A (5 sec)	1200 (5sec)	1500 (5sec)	1500A (5 sec)
Operating temperature range	-40°C~60°C/ -40°F~140°F			
Float charging voltage	13.6 to 13.8 VDC/ unit average at 25°C/ 77°F			
Recommended maximum charging current	36A	36A	36A	30A
Self-discharge	Valve Regulated Lead Acid can be stored for more than 6 months at 25°C/ 77°F. Self-discharge ratio less than 3% per month at 25°C/ 77°F. Please charge batteries before using			
Equalization and cycle service	14.6 to 14.8 VDC/unit Average at 25°C/ 77°F			
Terminal type	Terminal F5/F12			

Battery

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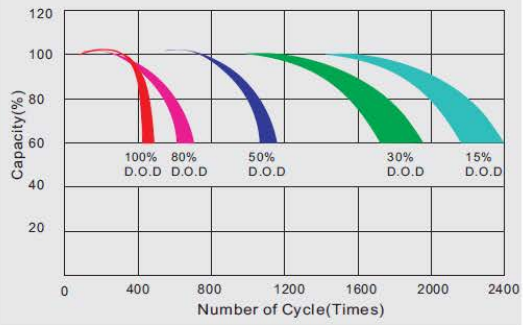
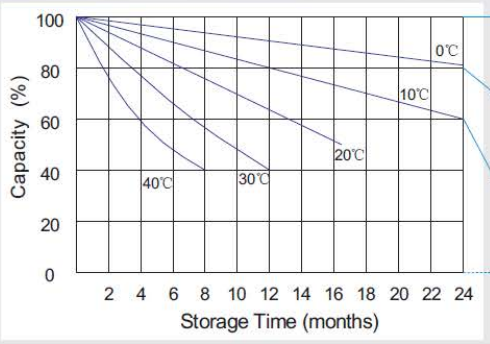
Life characteristics of cyclic use



Storage characteristic



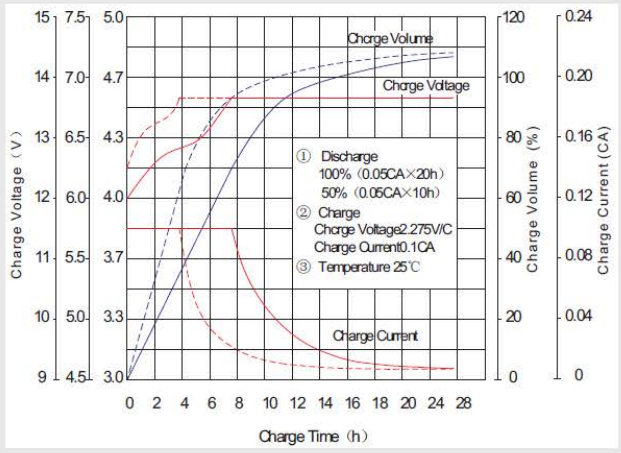
Supplementary charge required (Carry out supplementary charge before use if 100% capacity is requires)

Supplementary charge required before use. This supplementary charge will help to recover the capacity and should be made as early as possible.

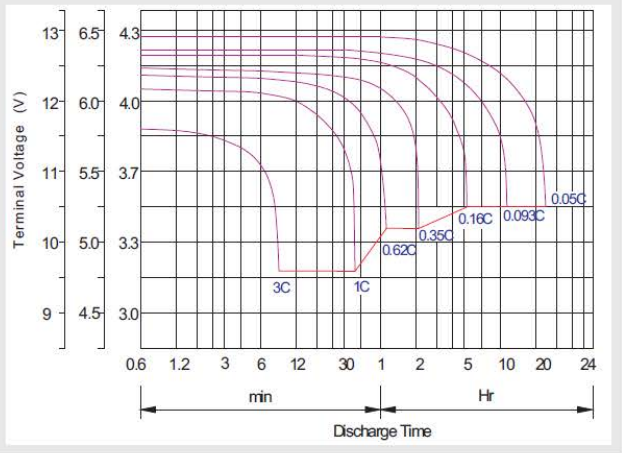
Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this state is reached

Supplementary charge and storage guidelines

Charge characteristic curve for cyclic use



Discharge characteristic curve



Capacity Factors With Different Temperature

Battery Type		-20℃	-10℃	0℃	5℃	10℃	20℃	25℃	30℃	40℃	45℃
GEL Battery	6V&12V	50%	70%	83%	85%	90%	98%	100%	102%	104%	105%
	2V	60%	75%	85%	88%	92%	99%	100%	103%	105%	106%
AGM Battery	6V&12V	46%	66%	76%	83%	90%	98%	100%	103%	107%	109%
	2V	55%	70%	80%	85%	92%	99%	100%	104%	108%	110%

Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/cell	1.75V	1.70V	1.60V
Discharge Current (A)	(A) ≤0.2C	0.2C< (A) <1.0C	(A) ≥1.0C

Charge the batteries at least once every six months, if they are stored at 25°C.

Charging Method:

Constant Voltage	-0.2Cx2h+2.4~2.45V/Cellx24h,Max. Current 0.3CA
Constant Current	-0.2Cx2h+0.1CAx12h
Fast	-0.2Cx2h+0.3CAx4.0h

Maintenance & Cautions

Cycle service
※ Avoid battery over discharge, especially battery sereis connection use.
※ Charged with recommend voltage, ensure battery can be full recharged.
In general, recharge capacity should be 1.1-1.15 times discharge capacity.
※ Effect of temperature on cycle charge voltage: -4mV/℃/Cell.
※ There are a number of factors that will affect the length of cyclic service.
The most significant are depth of discharge, ambient temperature,
discharge rate, and the manner in which the battery is recharged.
Generally specking, the most important factors is depth of discharge.

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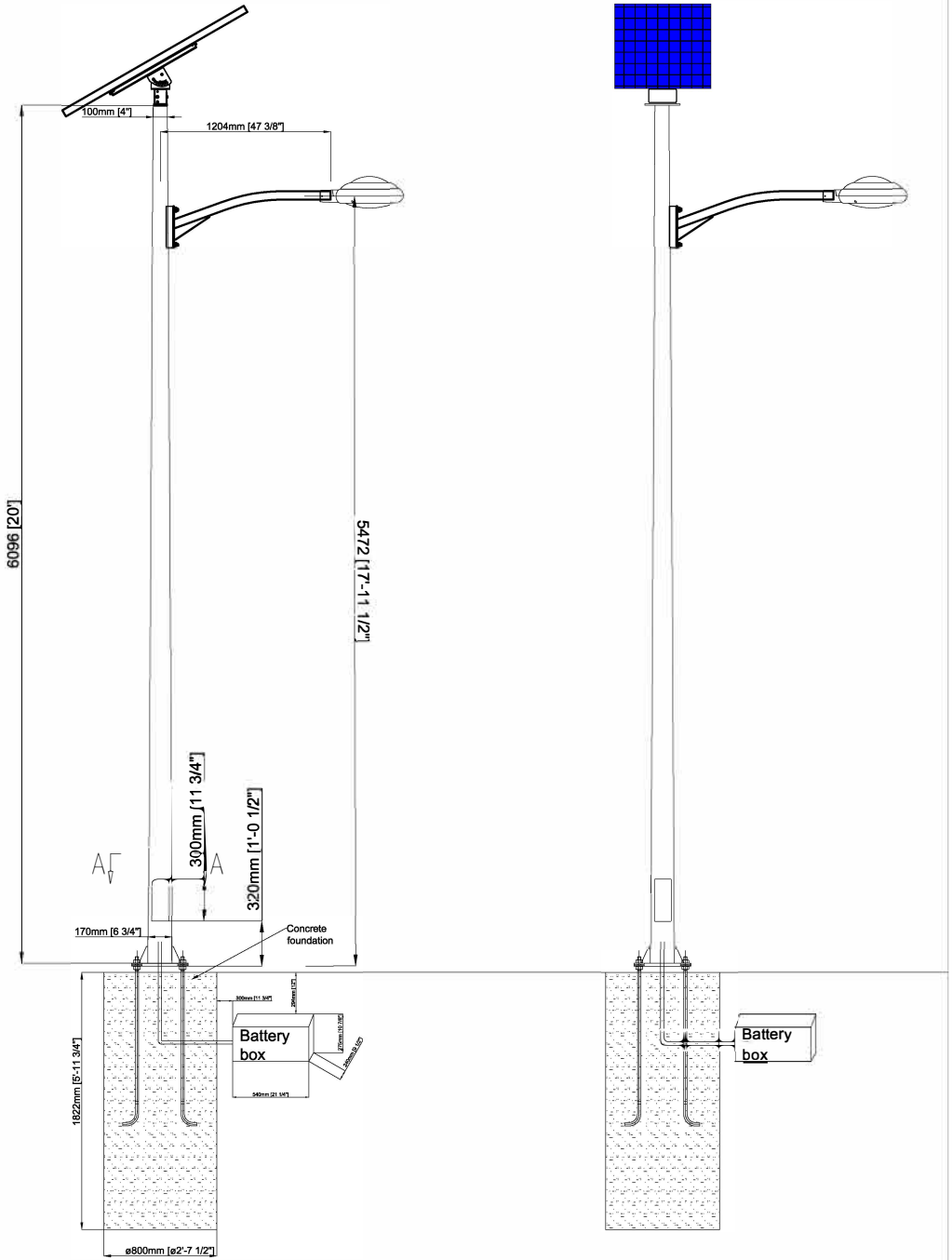
GS-LED-CTRL

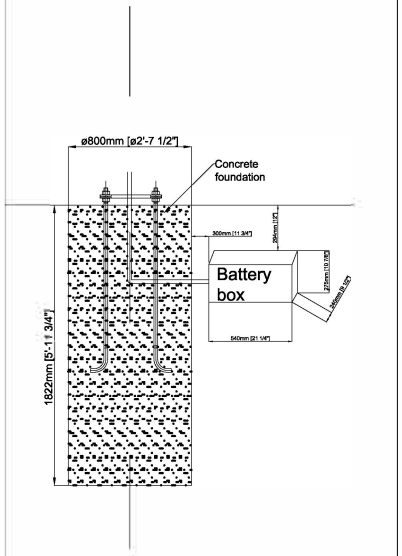
Features

- Corrosion-proof epoxy-encapsulated PCB (IP68)
- Four-stage battery charging (main, float, boost, equalization)
- Temperature compensated
- Automatic system voltage recognition (12V/24V)
- Customized by Greenshine to fit specific needs of clients
- Easy to installed

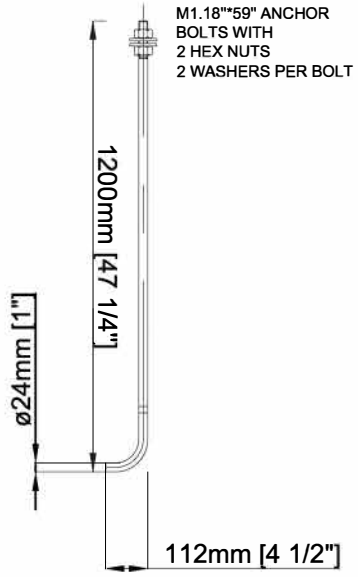
Specification

System voltage	12V/24V auto recognition
Max. charge/ load current	5A/ 10A/ 20A (different models)
Deep discharge protection:	
Cut-off voltage	11V – 12V/ 22V – 24V
Reconnect level	12.8V/25.6V
Overvoltage protection	15.5V/31.0V
Undervoltage protection	10.5V/21V
Max. panel voltage	U_{BATmin} + 30V (if module and battery are connected with correct polarity)
Temperature compensation	–25mV/K at 12V
(Charge voltage)	–50mV/K at 24V
Ambient temperature	–40°C to +60°C, –40°F to +140°F
Max. altitude	4,000m above sea level
Battery type	Lead acid (GEL, AGM, flooded)
Adjustment range:	
Evening/morning hours	0 – 15h/ 0 – 14h
Night/day detection	2.5V – 10V
Wire cross section	1.5mm²/ 1.5mm²/ 2.5mm², 15 (AWG)
Type of protection	IP68 (1.5 m, 72 h)

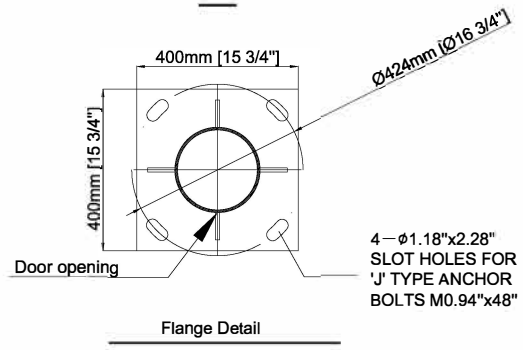




ANCHOR BOLT DETAIL



A-A



Flange Detail

- Foundation dimensions shall be confirmed by a local engineering company, Greenshine New energy will not be held liable for any defect of the concrete foundation due to improper sizing.
- Drawings are based using hot-dipped galvanized steel, powder coating with a thickness of $\frac{5}{32}$".
- *EPA of the system exclude the EPA of the pole, includes the solar panels, brackets, arm and LED fixture and battery box.
- **Wind resistance of the poles are indicative and further customization can be provided.

Tilt angle of the solar panels	15	30	45	60
EPA (ft^2)*	4.26	6.89	9.14	10.88
Wind resistance** (mph)	145	145	145	145

Proposal	Greenshine		
System	Brighta series - 20' pole -1 panels		
By		Date	6/24/2014

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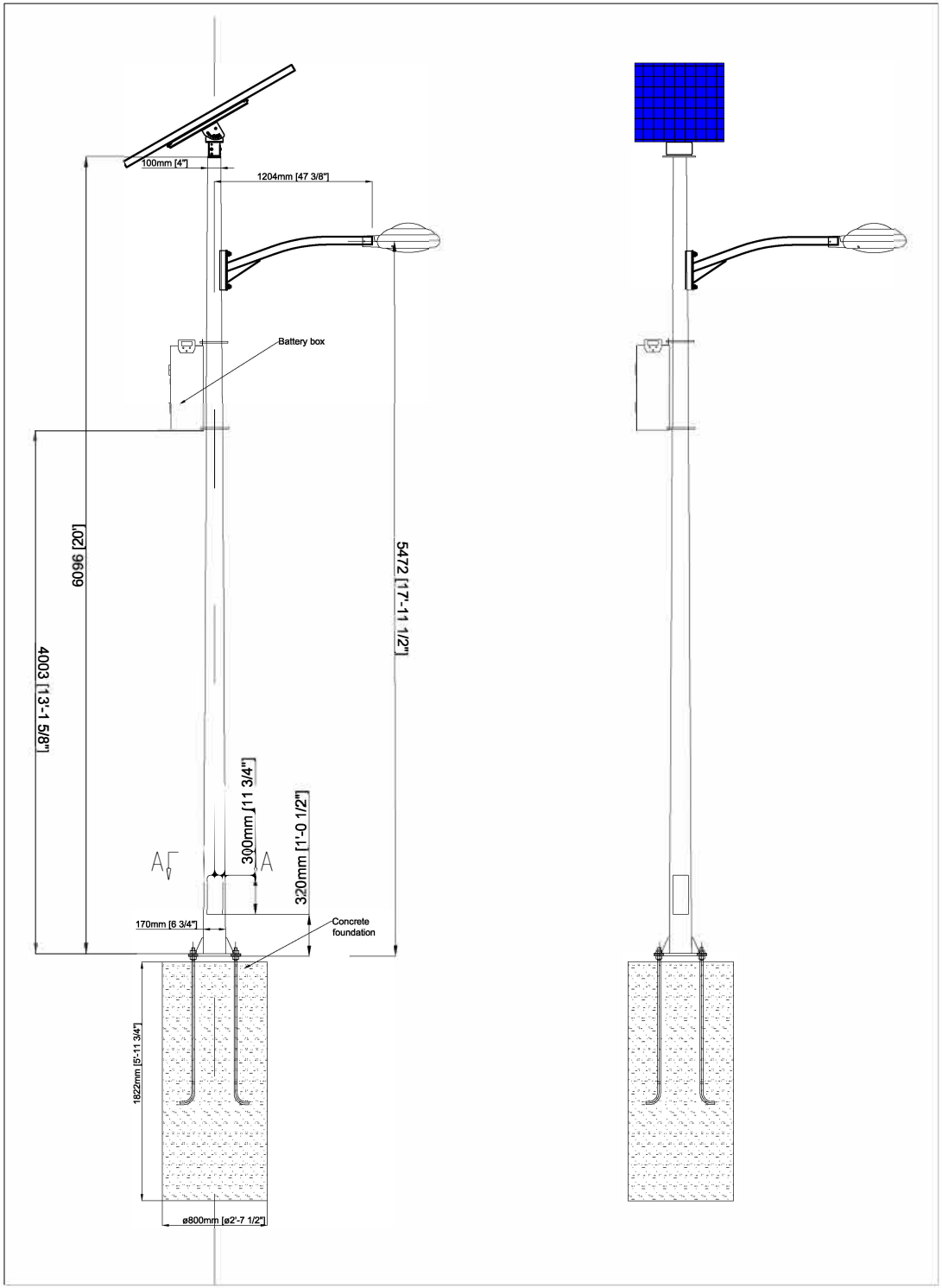
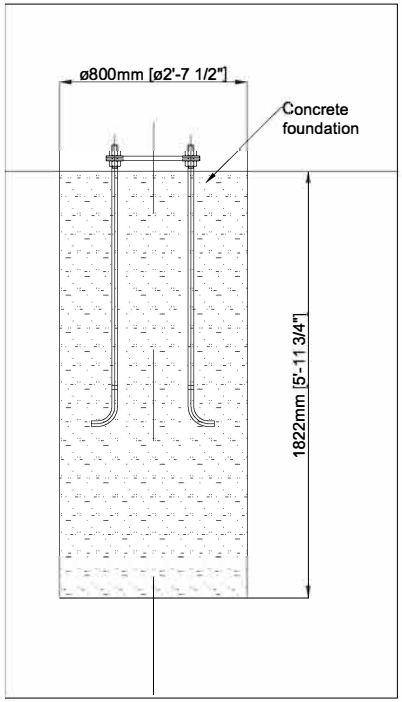
m





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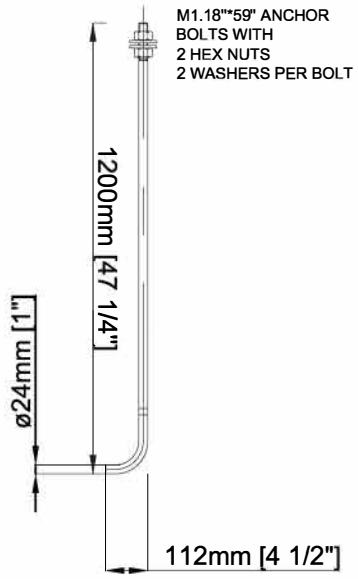

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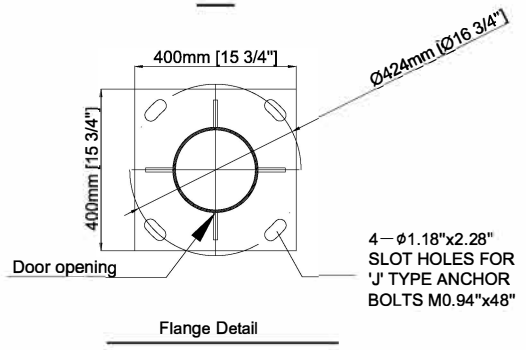

Flange Detail

- Foundation dimensions shall be confirmed by a local engineering company, Greenshine New energy will not be held liable for any defect of the concrete foundation due to improper sizing.
- Drawings are based using hot-dipped galvanized steel, powder coating with a thickness of $\frac{5}{32}$" .
- *EPA of the system exclude the EPA of the pole, includes the solar panels, brackets, arm and LED fixture and battery box.
- **Wind resistance of the poles are indicative and further customization can be provided.

Tilt angle of the solar panels	15	30	45	60
EPA (ft^2)*	6.68	9.31	11.57	13.3
Wind resistance** (mph)	145	145	145	145

Proposal	Greenshine		
System	Brighta series - 20' pole -1 panel		
By		Date	6/24/2014

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m

Appendix C

Fire Protection Material Data Sheets

2nd St. Pathways Individual Shelter Electrical Improvements
2021-1134

Prepared for:
City of Berkeley, Public Works Department

Prepared by:
Ethan Brown, PE, M.Eng.FPE

April 21, 2023

INTERFACE ENGINEERING

SCHEDULE 10 & 40

Always ready to protect your most valuable assets.

As the leading supplier of steel sprinkler pipe, we understand that there are no second chances in fire suppression. You need products of enduring quality and exceptional strength–plus reliable service. You need Bull Moose.

Bull Moose Fire Sprinkler Pipe Product Information

	Nominal Pipe Size (Inches)	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
SCHEDULE 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.820	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086
	C.R.R.	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805
	Pieces per Lift	91	61	61	37	30	19	19	10	7
	Lift Weight (lbs) 21' lengths	2,695	2,319	2,677	2,051	2,224	1,732	2,242	1,951	2,490
	Lift Weight (lbs) 24' lengths	3,079	2,650	3,060	2,344	2,542	1,979	2,563	2,230	2,848
	Lift Weight (lbs) 25' lengths	3,208	2,760	3,187	2,442	2,648	2,062	2,670		

	NPS (In.)	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
SCHEDULE 40		1.315	1.660	1.900	2.375	2.875	3.500	4.500
		1.049	1.380	1.610	2.067	2.469	3.068	4.026
		1.680	2.270	2.720	3.660	5.800	7.580	10.800
		2.055	2.918	3.602	5.114	7.875	10.783	16.316
		1.00	1.00	1.00	1.00	1.00	1.00	1.00
		70	51	44	30	30	19	19
		2,470	2,431	2,513	2,306	3,654	3,024	4,309
		2,822	2,778	2,872	2,635	4,176	3,456	4,925
		2,940	2,894	2,992	2,745	4,350	3,601	5,130

SCHEDULE 10 & 40 ADVANTAGES:

- UL listed (US & Canada) and FM approved
- ASTM A135 and A795 Type E, Grade A Certified
- Complies with NFPA-13, 13R and 14
- Industry-leading hydraulic characteristics
- CRR of 1.0 and greater
- All pipe NDT weld tested

OTHER BENEFITS/SERVICES:

- We have the most stocking locations in the industry, for best delivery and availability
- Plain end or roll groove
- Eddy Guard II™ bacterial-resistant internal coating
- Custom length options
- Hot dipped galvanization
- Reddi-Pipe® red or black pipe eliminates field painting
- Compatible for use in wet, dry, preaction and deluge sprinkler systems
- The only maker with EPDs (to help earn LEED points).

Exclusive maker of Reddi-Pipe®
RED OR BLACK PAINTED PIPE.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

c UL us LISTED

FM APPROVED

NFPA

AFSA American Fire Sprinkler Association

NFSA The Voice of the Fire Sprinkler Industry

BULL MOOSE TUBE

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sales@BullMooseIndustries.com
BullMooseTube.com

Fig. 20 - Standard Pipe Strap
Fig. 20S - Flush Mount Pipe Strap

Size Range — 1/2" thru 8" pipe

Material — Carbon Steel

Function — Recommended for supporting pipe with fittings vertically or horizontally to walls or ceiling. Fig. 20S will support pipe flush with mounting surface.

Approvals — Conforms to Federal Specification WW-H-171E, Type 26 and Manufacturers Standardization Society SP-69, Type 26.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, pipe size, material and finish

Data Table for Fig. 20S

Dimensions • Weights							
Pipe Sizes	A	B	C	D	Hole Size	Max. Rec. Load Lbs.	Approx. Wt./100
1/2	4 1/8	5/16	2 7/8	3/4	7/16	410	21
3/4	4 5/16	7/16	3	15/16	7/16	410	24
1	4 9/16	9/16	3 3/8	1 1/8	7/16	410	26
1 1/4	4 15/16	11/16	3 3/4	1 1/2	7/16	410	30
1 1/2	5 3/16	13/16	4 1/4	1 5/8	7/16	410	33
2	5 3/4	1 1/16	4 3/4	2 1/4	7/16	410	38
2 1/2	6 1/4	1 9/16	5 1/4	2 3/4	7/16	610	102
3	6 7/8	1 5/8	5 7/8	3 3/8	7/16	610	118
3 1/2	7 3/8	1 7/8	6 3/8	3 7/8	7/16	610	130
4	8 3/8	2 1/8	7	4 3/8	9/16	725	159
5	9 7/16	2 5/8	7 7/8	5 3/8	9/16	725	191
6	10 1/2	3 3/16	8 7/8	6 7/16	9/16	725	234
8	14	4 1/4	11 1/2	8 3/8	11/16	900	446

Data Table for Fig. 20

Dimensions • Weights							
Pipe Sizes	A	B	C	D	Hole Size	Max. Rec. Load Lbs.	Approx. Wt./100
1/2	3 7/8	3/4	3 1/16	15/32	7/16	410	16
3/4	4	13/16	3 1/8	1 5/16	7/16	410	21
1	4 9/16	7/8	3 3/8	1 1/2	7/16	410	26
1 1/4	4 15/16	1	3 3/4	1 7/8	7/16	410	30
1 1/2	5 3/16	1 3/16	4 1/4	2 1/8	7/16	410	33
2	5 3/4	1 7/16	4 3/4	2 5/8	7/16	410	38
2 1/2	6 1/4	1 11/16	5 1/4	3 1/8	7/16	610	102
3	6 7/8	2	5 7/8	3 3/4	7/16	610	118
3 1/2	7 3/8	2 1/4	6 3/8	4 1/4	7/16	610	130
4	8 3/8	2 1/2	7	4 3/4	9/16	725	159
5	9 7/16	3 1/16	7 7/8	5 13/16	9/16	725	191
6	10 1/2	3 5/8	8 7/8	6 7/8	9/16	725	234
8	14	4 5/8	11 1/2	9	11/16	900	446

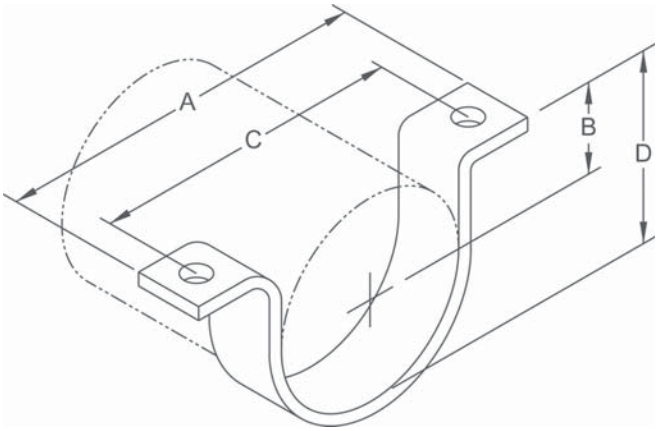

FIG. 21 - "Tin Strap"

Size Range — 1/2" thru 2" pipe

Material — Pre-Galvanized Steel

Function — Light duty strap that attaches pipe or copper tubing to horizontal or vertical structure.

Finish — Pre-Galvanized

Note — Available with felt lining, order TOLCO® Fig. 21F.

Order By — Figure number and pipe size

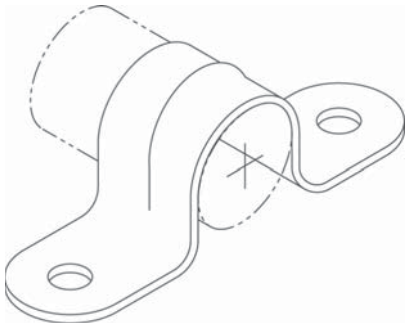

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Fig. 42 - Angle Bracket

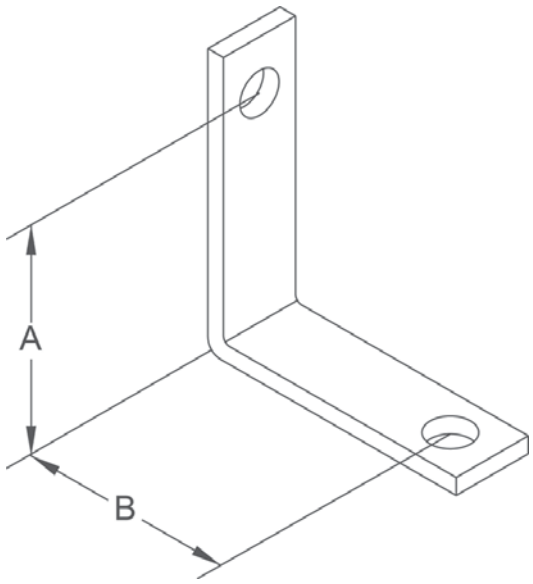
Material — Carbon Steel

Function — Recommended for supporting pipe at various distances from wall or column.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, size and finish



Dimensions • Weights

Size	A	B	Hole Size	Max. Rec. Load Lbs.	Approx. Wt./100
1	3	2	7/16	180	46
2	4	3	7/16	180	65
3	3	2	9/16	390	85
4	4	3	9/16	390	115

Fig. 50 - Side Beam Bracket

Size Range — 3/8" thru 7/8" rod

Material — Carbon Steel

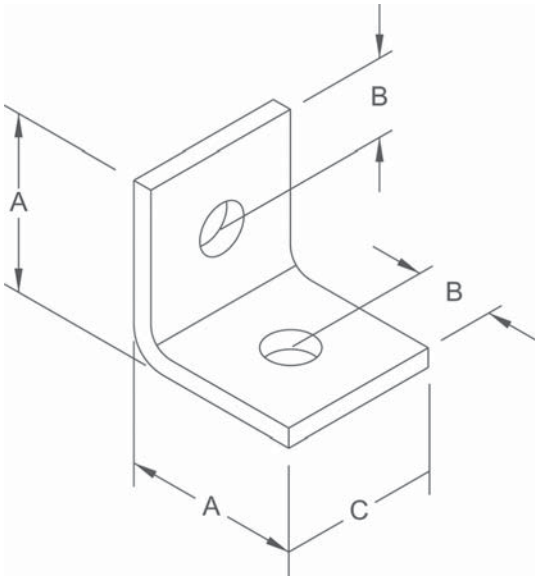
Function — Recommended for attaching hanger rod to side of beams or walls.

Approvals — 3/8", Underwriters' Laboratories Listed in the USA **(UL)** and Canada **(cUL)**, and Factory Mutual Engineering approved.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, rod size and finish



Dimensions • Weights

Rod Size	A	B	C	Hole Size	Max. Rec. Load Lbs.	Approx. Wt./100
3/8	2	3/4	2	7/16	700	35
1/2	2	3/4	2	9/16	700	35
5/8	2	3/4	2	11/16	700	32
3/4	2½	3/4	2½	13/16	1250	110
7/8	2½	3/4	2½	15/16	1250	100

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Fig. 78 - All Steel Ceiling Plate

c UL US LISTED

Size Range — 3/8" rod

Material — Carbon Steel

Features — Attachment to wood beams, ceilings, metal decks or walls. Can also be welded to steel beams.

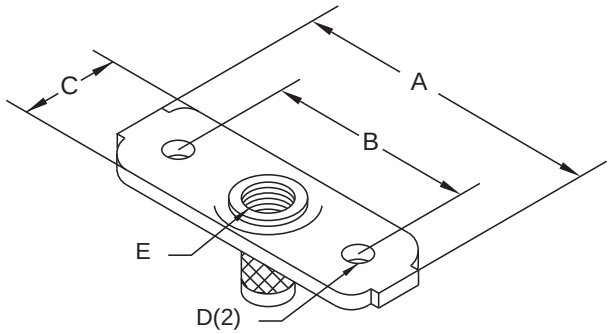
Approvals — Underwriters' Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Additionally, **(UL)** has listed the Fig. 78 with fasteners as shown in the table below.

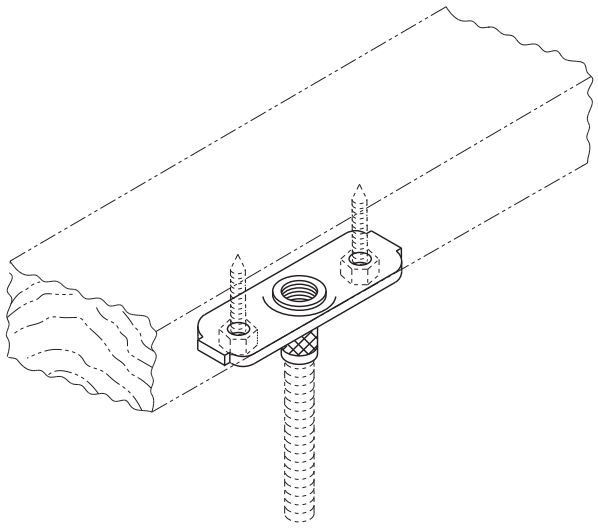
Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, rod size and finish

Patent #5,702,077





UL Listed Fastener Table

Pipe Size	Qty	Fastener Type	Material
1/2 - 2	2	#14 x 1¼ A-point hex-washer-head sheet metal screw	Wood
2½ - 4	2	1/4 x 1½ wood screws*	Wood
1/2 - 2	2	1/4 x 1 tek screws	Metal (18 gauge)
1/2 - 2	2	#14 x 1¼ A-point hex-washer-head sheet metal screw	Wood
1/2 - 2	2	#14 x 2 A-point-hex-washer-head sheet metal screw	Wood thru 5/8" gyp board

* No pre-drilling

Dimensions • Weights

Pipe Size	A	B	C	D	E	Max. Rec. Load Lbs.*	Approx. Wt./100
1/2 - 2	3	2⅛	1⅛	5/16	3/8	150	15
5 - 6	Consult factory for data						

* Minimum safety factor of 5

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Victaulic® Brass Body Ball Valve
Series 722

08.15

1.0 PRODUCT DESCRIPTION

Available Sizes

- ¼ – 2"/DN8 – DN50

Maximum Working Pressure

- See section 5.0 for pressure ratings

Operating Temperature Range

- -4°F to +250°F/-20°C to +121°C
- Maximum temperature for dry saturated steam: +365°F/+185°C

Function

- Standard port, female NPT threaded end valve for on/off service
- Standard port, female BSPT threaded end valve for on/off service (CCCf approved valve only)

2.0 CERTIFICATION/LISTINGS

NOTE

- Download publication 10.01 for Fire Protection Certifications/Listings Reference Guide.

3.0 SPECIFICATIONS – MATERIAL

Series 722 Brass Body Ball Valve

Body: Forged brass, per ASTM B124

Ball: Brass, chrome plated, per ASTM B124

Stem: Brass, per ASTM B124

Seat: Polytetrafluoroethylene (PTFE)

Handle: Carbon steel, zinc plated, with vinyl grip

Stem Nut: Carbon steel, zinc plated

Stem Washer: Polytetrafluoroethylene (PTFE)

O-Ring: Fluoroelastomer.

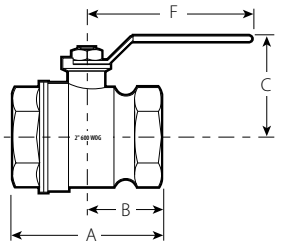
ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

4.0 DIMENSIONS

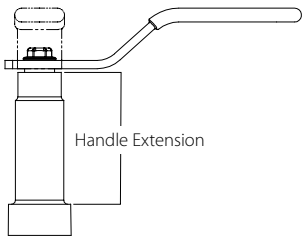
Series 722 Brass Body Ball Valve



Size		Dimensions				Weight
Nominal inches DN	**Nominal Actual Outside** inches mm	**A** inches mm	**B** inches mm	**C** inches mm	**F** inches mm	**Approximate (Each)** lb kg
¼ DN8	0.540 13.7	1.54 39	0.77 20	1.03 26	1.65 42	0.2 0.1
⅜ DN10	0.675 17.1	1.77 45	0.88 22	1.28 33	3.07 78	0.3 0.1
½ DN15	0.840 21.3	2.13 54	1.06 27	1.33 34	3.07 78	0.4 0.2
¾ DN20	1.050 26.9	2.44 62	1.22 31	1.79 45	3.78 96	0.7 0.3
1 DN25	1.315 33.7	2.95 75	1.48 37	1.95 50	3.78 96	1.0 0.5
1 ¼ DN32	1.660 42.4	3.31 84	1.65 42	2.17 55	3.78 96	1.5 0.7
1 ½ DN40	1.900 48.3	3.66 93	1.83 46	2.68 68	5.43 138	2.1 1.0
2 DN50	2.375 60.3	4.21 107	2.11 53	2.89 73	5.43 138	2.4 1.1

4.1 OPTIONAL PART

Handle Extension (Optional)



Valve Inlet Size	2" Handle Extension Victaulic Part Code
⅜ – ½"	P0047222XT
¾ – 1 ¼"	P0067222XT
1 ½ – 2"	P0147222XT

5.0 PERFORMANCE

Maximum Working Pressure (At +68°F/+20°C)

- ¼ – ¾"/DN8 – DN20: 600 psi/4138 kPa/41 bar
- 1 – 2"/DN25 – DN50: 500 psi/3448 kPa/34 bar
- ½ – 2"/DN15 – DN50: UL Listed at 175 psi/1207 kPa/12 bar
- ½ – ¾"/DN15 – DN20: FM Approved at 600 psi/4138 kPa/41 bar
- 1 – 2"/DN25 – DN50: FM Approved at 500 psi/3448 kPa/34 bar
- ½ – 2"/DN15 – DN50: CCCf Approved at 365 psi/2517 kPa/25 bar

5.1 PERFORMANCE

C_v/K_v Values:

C_v/K_v values for flow of water at 60°F/16°C are shown in the table below.
For additional details contact Victaulic.

Formulas for C_v and K_v values

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

Size		Flow
Nominal inches DN	**Actual Outside Diameter** inches mm	**Full Open** C_v K_v
¼ DN8	0.540 13.7	7.0 6.0
⅜ DN10	0.675 17.1	7.0 6.0
½ DN15	0.840 21.3	10.0 8.6
¾ DN20	1.050 26.9	25.0 21.4
1 DN25	1.315 33.7	37.0 31.7
1 ¼ DN32	1.660 42.4	50.0 42.8
1 ½ DN40	1.900 48.3	87.0 74.6
2 DN50	2.375 60.3	110.0 94.3

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

I-100: Victaulic Field Installation Handbook

08.15 1669 Rev H Updated 01/2021

TECHNICAL DATA

WATER AND AIR PRESSURE GAUGES

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

Viking Pressure Gauges give visual indication of the water or air pressure available to the fire protection system.

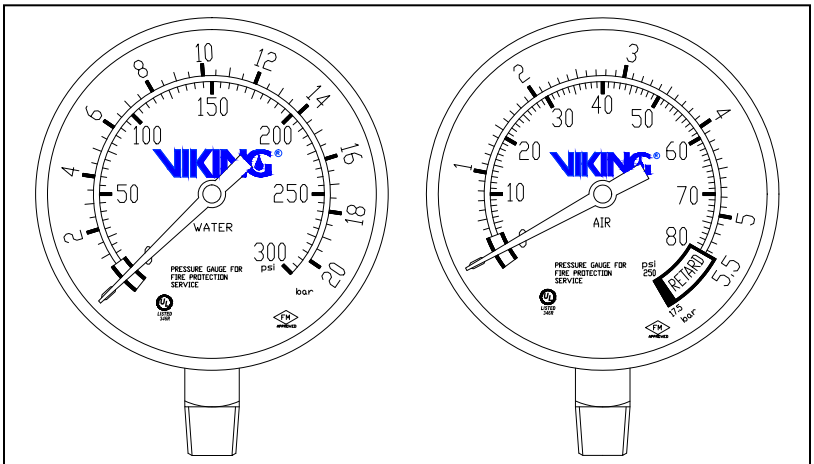
2. LISTINGS AND APPROVALS

UL Listed - VEVX
ULc Listed - VEVXC
FM Approved - Pressure Gauges

3. TECHNICAL DATA

Connection: 1/4" NPT
Working Pressure:

- Water Gauge: 300 PSI (20.7 bar)
- Water Gauge: 600 PSI (41.4 bar)
- Air Gauge: 250 PSI (17.2 bar) (Air gauge includes a "Retard Zone" between 80 and 250 PSI)



Water Pressure Gauge **Air Pressure Gauge**

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

Material Standards

Case and window: Plastic
Bourdon Tube: Bronze
Socket: Brass

Ordering Information

Available since 1977.
300 PSI (20.7 bar) Water Pressure Gauge - VWATERSF
600 PSI (41.4 bar) Water Pressure Gauge - VWATERSF600
250 PSI (17.2 bar) Air Pressure Gauge - VAIRSF

4. INSTALLATION

1. Gauges are to be installed in accordance with the latest published standards of the National Fire Protection Association or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards whenever applicable.
2. Gauges must be handled with care. They must be stored in a cool, dry place in their original shipping container. Never install gauges that have been dropped or damaged in any way. Such gauges should be destroyed immediately.
3. Adequate heat must be provided where gauges are installed.
4. The gauges must be protected from mechanical damage. Install the gauges according to the following steps:
   a. Apply a small amount of pipe-joint compound or tape to the external threads of the gauge only. Take care that no joint compound is allowed into the orifice of the gauge.
   b. Turn the unit clockwise to thread the gauge into the 1/4" (6.4 mm) NPT connection of the fitting. DO NOT over-tighten the gauge.

5. AVAILABILITY

The water and air gauges are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

6. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

VIKING®

TECHNICAL DATA

FREEDOM® RESIDENTIAL UPRIGHT SPRINKLER VK467 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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1. DESCRIPTION

Viking Freedom® Residential Upright Sprinkler VK467 is a small, thermosensitive, glass-bulb residential sprinkler available in several different finishes and temperature ratings to meet varying design requirements. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is C-UL-US-EU Listed as corrosion resistant as indicated in the Approval Chart. The orifice design, with a K-Factor of 4.9 (70.6 metric†), allows efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

2. LISTINGS AND APPROVALS

c UL us EU **UL Listed (C-UL-US-EU):** Category VKKW

NYC Approved: MEA 89-92-E, Volume 35

Refer to the Approval Chart Design Criteria for C-UL-US-EU Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Available since 2014.
Minimum Operating Pressure: Refer to the Approval Chart.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2” (15 mm) NPT
Nominal K-Factor: 4.9 U.S. (70.6 metric†)
†Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000 or Bronze UNS-C22000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Polytetrafluoroethylene (PTFE) Tape
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Compression Screw: Brass UNS-C36000
For ENT coated sprinklers: Belleville spring - Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)

Sprinkler: Base Part No. 19154
Order Sprinkler VK467 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D
For example, sprinkler VK467 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 19154AB.

Available Finishes And Temperature Ratings:

Refer to Table 1.

Accessories: (Also refer to Viking website.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 21475M/B (available since 2017)

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

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4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Model VK467 Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT			
Corrosion Resistant Coatings[3]: ENT			

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For ENT coated sprinklers, the waterway is coated. Note that the spring is exposed on sprinklers with ENT coating.

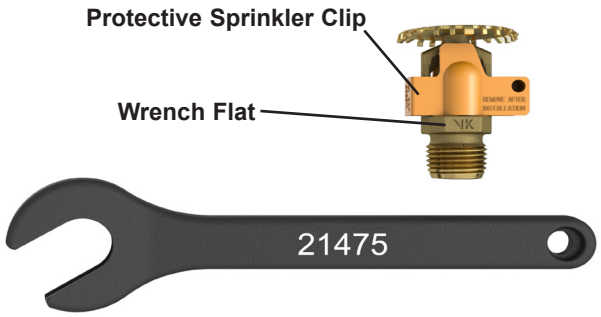

Figure 1: Standard Sprinkler Wrench 21475M/B

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Approval Chart
Viking VK467, 4.9 K-Factor Residential Upright Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

Sprinkler Base Part Number[1]	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric[2]		Inches	mm
19154	VK467	1/2	15	4.9	70.6	175 psi (12 bar)	2-1/4	58

Max. Coverage Area[4] Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals[3]			Minimum Spacing Ft. (m)
	Flow[4] GPM (L/min)	Pressure[4] PSI (bar)	Flow[4] GPM (L/min)	Pressure[4] PSI (bar)			c UL us EU	NYC	NSF	
12 X 12 (3.7 X 3.7)	14 (53.0)	8.16 (0.56)	14 (53.0)	8.16 (0.56)	3 - 5 inches	Upright	See Foot-note 7 and 9.	See Foot-note 6.	See Foot-note 7.	9 (2.74)
14 X 14 (4.3 X 4.3)	14 (53.0)	8.16 (0.56)	14 (53.0)	8.16 (0.56)						
16 X 16 (4.9 X 4.9)	16 (60.6)	10.66 (0.73)	16 (60.6)	10.66 (0.73)						
12 X 12 (3.7 X 3.7)	15 (56.8)	9.37 (0.65)	15 (56.8)	9.37 (0.65)	5 - 10 inches					
14 X 14 (4.3 X 4.3)	15 (56.8)	9.37 (0.65)	15 (56.8)	9.37 (0.65)						
16 X 16 (4.9 X 4.9)	18 (68.1)	13.49 (0.93)	18 (68.1)	13.49 (0.93)						
12 X 12 (3.7 X 3.7)	15 (56.8)	9.37 (0.65)	--	--	1 to 3 inch-es below 14 inch beams					
14 X 14 (4.3 X 4.3)	15 (56.8)	9.37 (0.65)	--	--						
16 X 16 (4.9 X 4.9)	18 (68.1)	13.49 (0.93)	--	--						

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to Viking's current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.

[4] For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.

[5] Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.

[6] Meets New York City requirements, effective July 1, 2008.

[7] Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester[8]

[8] Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.

[9] C-UL-US-EU listed as corrosion resistant - Electroless Nickel PTFE (ENT)

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DESIGN CRITERIA

(Also refer to the Approval Chart.)

UL Listing Requirements (C-UL-US-EU):

When using Viking Residential Upright Sprinkler VK467 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1 of NFPA 13.
- Minimum distance between residential sprinklers: 9 ft. (2.74 m).

BEAM CEILING GUIDELINES

C-UL-US-EU Listed for installation in residential occupancies with beam ceilings (with horizontal ceilings only).
Refer to the Approval Chart for sprinkler areas of coverage and hydraulic design.

Sprinkler Location: Locate sprinklers on the underside of the beams (not in the bays or pockets formed by the beams). Refer to Figure 2. The vertical distance from the sprinkler deflector to the bottom of the primary beam must be between 1" and 3" (25 to 76 mm). The horizontal distance from the centerline of the sprinkler to the primary beam cannot be more than 2" (51 mm) (Figure 2).

Beam Position: Directly attached to the underside of a combustible or non-combustible smooth ceiling of any height.

Beam Size and Shape (Cross section):

- Depth: Maximum 14" (356 mm) for primary beams. Secondary beam depth cannot be greater than the primary beam.
- Width: Unlimited.
- Beam Shape: Rectangular to circular.

Beam Types: Combustible or non-combustible, solid surface, solid or hollow core.

Beam Spacing:

A. For primary beams, the distance from the wall to the center of the nearest primary beam must be at least 3'-4" (1.0 m), and not more than one-half the listed sprinkler spacing. **Note**: Sprinklers may not be required to be located in the first beam nearest the wall. Center-to-center distance between primary beams is to be a maximum of 16 ft (4.9 m). Refer to Figure 3A.

B. When beam pockets created by the primary beams exceed 20 ft (6.1 m) in length, secondary beams are required as follows (also refer to Figure 3B):
   1. Secondary beam depth must be equal to primary beam depth.
   2. Secondary beams must be placed so that the bays formed by the primary beams do not exceed 20 ft (6.1 m) in length.

C. When primary beam spans do not exceed 20 ft (6.1 m), secondary beams (not required) may have any distance from wall to nearest secondary beam and any distance center to center between secondary beams. Refer to Figure 3C.

Also:

When primary beam spans exceed 20ft (6.1m) an alternate protection scheme for the compartment would be to calculate all the sprinklers in the compartment. Refer to Figure 5.

- More stringent design requirement.
- Secondary beams or baffles would not be required for a compartment space design.
- The minimum required discharge from each sprinkler would utilize flow rates given in the Approval Chart for NFPA 13D and NFPA13R applications

Lintels: Must be present over doorways exiting the compartment. Lintel height must be at least 8" (203 mm), or at least the depth of the primary beams, whichever is greater.

Beam and Soffit Arrangements: If a soffit is installed, beams may be arranged within the soffit. The cross section of the soffit may be any size, provided it does not create an obstruction to water distribution per the obstruction rules of NFPA 13 for residential sprinklers. Where there is a soffit, beam spacing from the wall is to be measured from the face of the soffit rather than the wall. Refer to Figure 3D. **NOTE:** The sprinkler area of coverage is to be measured from the wall.

Definitions:

- Primary beams: The main beams that run primarily in one direction.
- Secondary beams: The beams that run perpendicular to the main beams.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No.s F_080190, F_080814, and F_080415 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.

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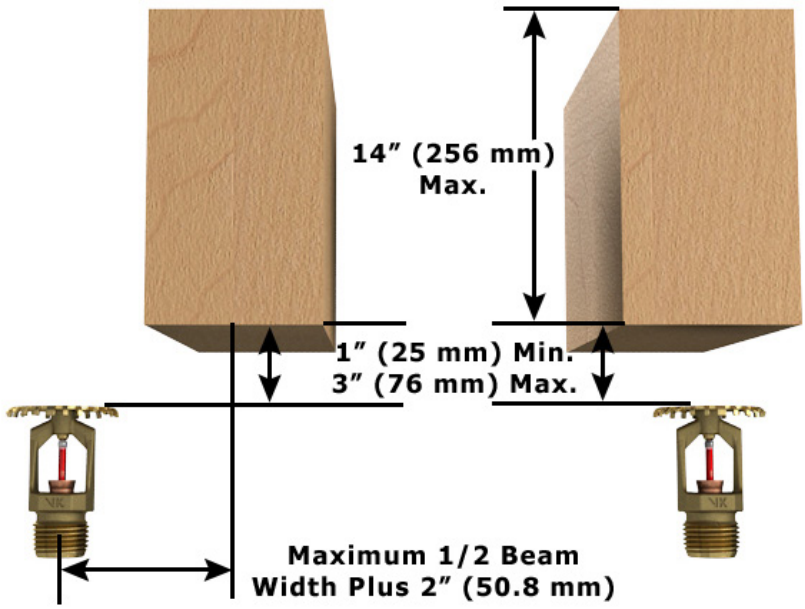

Figure 2: Sprinkler Positioning Under Primary Beams

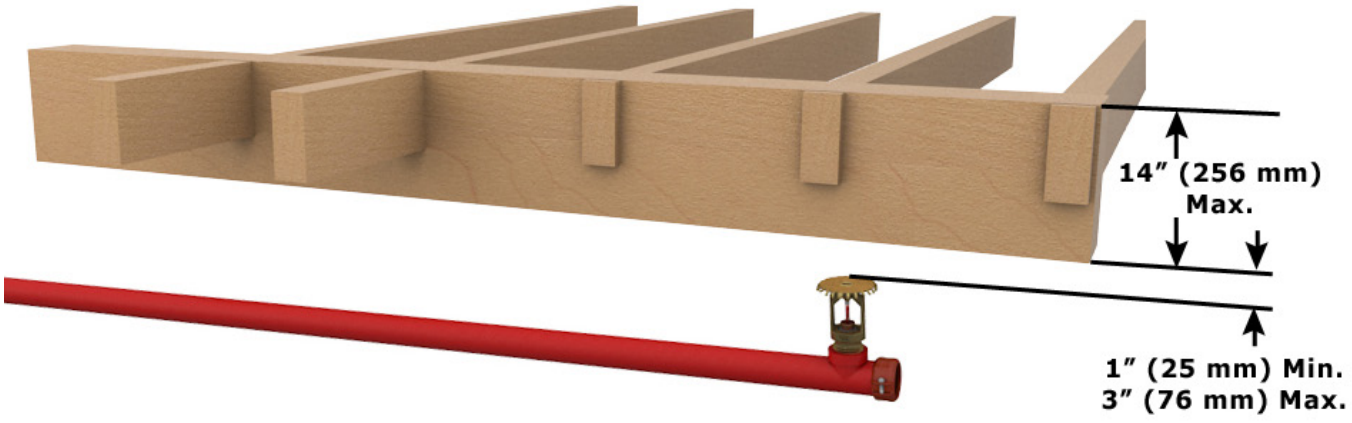

Figure 3: Sprinkler Positioning Under Primary Beams

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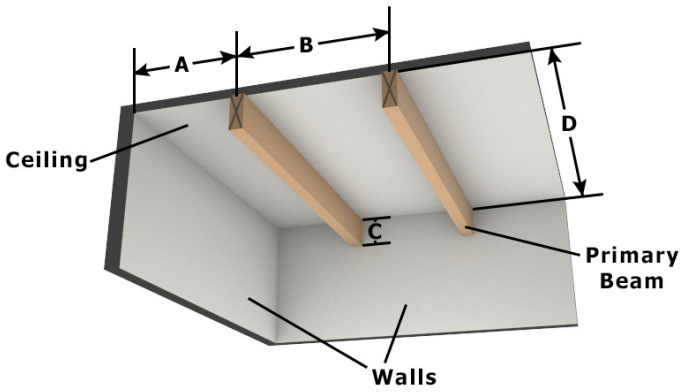
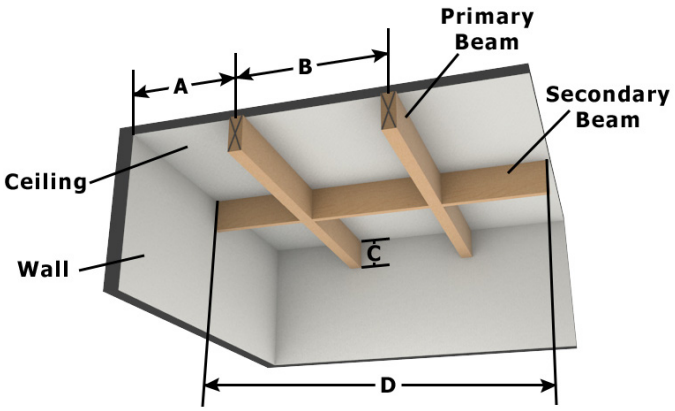


All dimensions are measured to wall faces and to centerlines of beams.

A = Distance from wall to nearest primary beam:
Minimum: 3 ft 4 in (1.0 m).
Maximum: No more than 1/2 listed sprinkler spacing.
B = Spacing between primary beams: 16 ft (4.9 m) maximum
C = Beam depth: 14” (356 mm) maximum
D = Beam span: 20 ft (6.1 m) maximum

Figure 4A: Primary Beam Spans up to 20 ft (6.1 m)

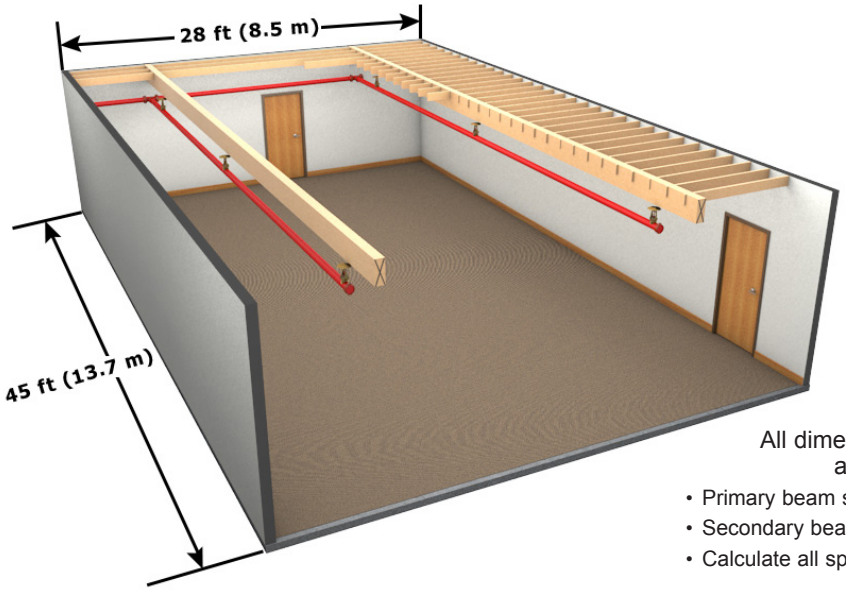


All dimensions are measured to wall faces and to centerlines of beams.

A = Distance from wall to nearest primary beam:
Minimum: 3 ft 4 in (1.0 m).
Maximum: No more than 1/2 listed sprinkler spacing.
B = Spacing between primary beams: 16 ft (4.9 m) maximum
C = Beam depth: 14” (356 mm) maximum
D = 20 ft (6.1 m) maximum for secondary beams that are to be equal in depth for primary beams and that are required so that primary beam pockets do not exceed 20 ft (6.1 m).

Figure 4B: Primary Beam Spans over 20 ft (6.1 m)

EXAMPLE



All dimensions are measured to wall faces and to centerlines of beams.

- Primary beam spans exceeding 20 ft (6.1 m)
- Secondary beams or baffles not required
- Calculate all sprinklers in compartment
  (Above example 6 sprinklers)

Figure 5: Alternate Entire Compartment Protection Scheme Example

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

General Handling and Storage:

- Store sprinklers in a cool, dry place.
- Protect sprinklers during storage, transport, handling, and after installation.
- Use the original shipping containers. DO NOT place sprinklers loose in boxes, bins, or buckets.
- Keep sprinklers separated at all times. DO NOT allow metal parts to contact sprinkler operating elements.

For Pre-Assembled Drops:

- Protect sprinklers during handling and after installation.
- For recessed assemblies, use the protective sprinkler cap (Viking Part Number 10364).

Sprinklers with Protective Shields or Caps:

- DO NOT remove shields or caps until after sprinkler installation and there no longer is potential for mechanical damage to the sprinkler operating elements.
- **Sprinkler shields or caps MUST be removed BEFORE placing the system in service!**
- Remove the sprinkler shield by carefully pulling it apart where it is snapped together.
- Remove the cap by turning it slightly and pulling it off the sprinkler.

Sprinkler Installation:

- DO NOT use the sprinkler deflector or operating element to start or thread the sprinkler into a fitting.
- **Use only the designated sprinkler head wrench!** Refer to the current sprinkler technical data page to determine the correct wrench for the model of sprinkler used.
- DO NOT install sprinklers onto piping at the floor level.
- Install sprinklers after the piping is in place to prevent mechanical damage.
- DO NOT allow impacts such as hammer blows directly to sprinklers or to fittings, pipe, or couplings in close proximity to sprinklers. Sprinklers can be damaged from direct or indirect impacts.
- DO NOT attempt to remove drywall, paint, etc., from sprinklers.
- **Take care not to over-tighten the sprinkler and/or damage its operating parts!**

  Maximum Torque:

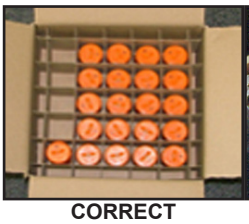
  1/2" NPT: 14 ft-lbs. (19.0 N-m)

  3/4" NPT: 20 ft-lbs. (27.1 N-m)

  1" NPT: 30 ft-lbs. (40.7 N-m)

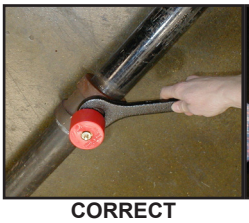
CORRECT
(Original container used)

INCORRECT
(Placed loose in box)



CORRECT
(Protected with caps)

INCORRECT
(Protective caps not used)



CORRECT
(Piping is in place at the ceiling)

INCORRECT
(Sprinkler at floor level)

CORRECT
(Special installation wrenches)

INCORRECT
(Designated wrench not used)

WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov

⚠ WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

VIKING | BULLETIN | CARE AND HANDLING OF SPRINKLERS

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PROTECTIVE SPRINKLER SHIELDS AND CAPS

General Handling and Storage:

Many Viking sprinklers are available with a plastic protective cap or shield temporarily covering the operating elements. The snap-on shields and caps are factory installed and are intended to help protect the operating elements from mechanical damage during shipping, storage, and installation. NOTE: It is still necessary to follow the care and handling instructions on the appropriate sprinkler technical data sheets* when installing sprinklers with bulb shields or caps.

WHEN TO REMOVE THE SHIELDS AND CAPS:

NOTE: SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

Remove the shield or cap from the sprinkler only after checking all of the following:

- The sprinkler has been installed*.
- The wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.

SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

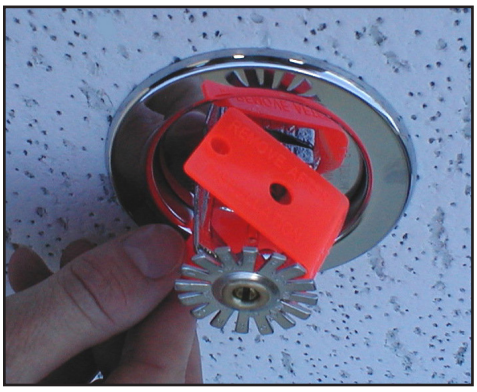


Figure 1: Sprinkler shield being removed from a pendent sprinkler.

Figure 2: Sprinkler cap being removed from a pendent sprinkler.

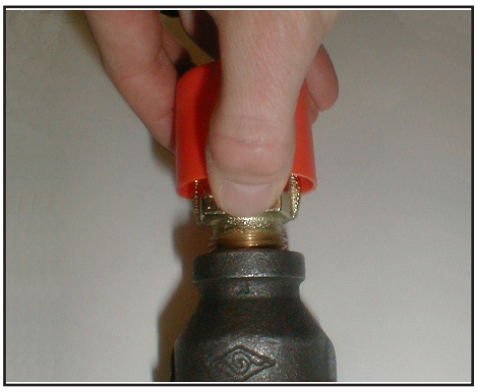


Figure 3: Sprinkler cap being removed from and upright sprinkler.

HOW TO REMOVE SHIELDS AND CAPS:

No tools are necessary to remove the shields or caps from sprinklers. DO NOT use any sharp objects to remove them! **Take care not to cause mechanical damage to sprinklers when removing the shields or caps.** When removing caps from fusible element sprinklers, use care to prevent dislodging ejector springs or damaging fusible elements. NOTE: Squeezing the sprinkler cap excessively could damage sprinkler fusible elements.

- To remove the shield, simply pull the ends of the shield apart where it is snapped together. Refer to Figure 1.
- To remove the cap, turn it slightly and pull it off the sprinkler. Refer to Figures 2 and 3.

NOTICE Refer to the current sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

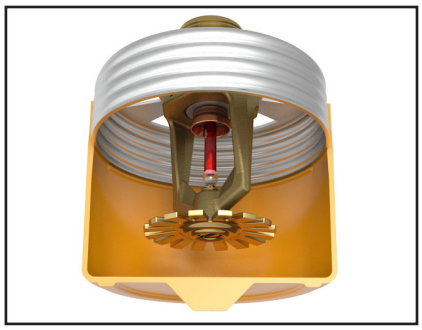
*** Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.**

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

⚠CAUTION CONCEALED COVER ASSEMBLIES ARE FRAGILE!
TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.



Concealed Sprinkler and Adapter Assembly with Protective Cap

Concealed Sprinkler and Adapter Assembly (Protective Cap Removed)

Cover Plate Assembly (Pendent Cover 12381 shown)

GENERAL HANDLING AND STORAGE INSTRUCTIONS:

- Do not store in temperatures exceeding 100 °F (38 °C). Avoid direct sunlight and confined areas subject to heat.
- Protect sprinklers and cover assemblies during storage, transport, handling, and after installation.
  -- Use original shipping containers.
  -- Do not place sprinklers or cover assemblies loose in boxes, bins, or buckets.
- Keep the sprinkler bodies covered with the protective sprinkler cap any time the sprinklers are shipped or handled, during testing of the system, and while ceiling finish work is being completed.
- Use only the designated Viking recessed sprinkler wrench (refer to the appropriate sprinkler data page) to install these sprinklers. **NOTE:** The protective cap is temporarily removed during installation and then placed back on the sprinkler for protection until finish work is completed.
- Do not over-tighten the sprinklers into fittings during installation.
- Do not use the sprinkler deflector to start or thread the sprinklers into fittings during installation.
- Do not attempt to remove drywall, paint, etc., from the sprinklers.
- Remove the plastic protective cap from the sprinkler before attaching the cover plate assembly. **PROTECTIVE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

VIKING

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

USE THE FOLLOWING PRECAUTIONS WHEN HANDLING WAX-COATED SPRINKLERS

Many of Viking's sprinklers are available with factory-applied wax coating for corrosion resistance. These sprinklers MUST receive appropriate care and handling to avoid damaging the wax coating and to assure satisfactory performance of the product.

General Handling and Storage of Wax-Coated Sprinklers:

- Store the sprinklers in a cool, dry place (in temperatures below the maximum ambient temperature allowed for the sprinkler temperature rating. Refer to Table 1 below.)
- Store containers of wax-coated sprinklers separate from other sprinklers.
- Protect the sprinklers during storage, transport, handling, and after installation.
- Use original shipping containers.
- Do not place sprinklers in loose boxes, bins, or buckets.

Installation of Wax-Coated Sprinklers:

Use only the special sprinkler head wrench designed for installing wax-coated Viking sprinklers (any other wrench may damage the unit).

- Take care not to crack the wax coating on the units.
- For touching up the wax coating after installation, wax is available from Viking in bar form. Refer to Table 1 below. The coating MUST be repaired after sprinkler installation to protect the corrosion-resistant properties of the sprinkler.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they would be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.
- Inspect the coated sprinklers frequently soon after installation to verify the integrity of the corrosion resistant coating. Thereafter, inspect representative samples of the coated sprinklers in accordance with NFPA 25. Close up visual inspections are necessary to determine whether the sprinklers are being affected by corrosive conditions.

TABLE 1

Sprinkler Temperature Rating (Fusing Point)	Wax Part Number	Wax Melting Point	Maximum Ambient Ceiling Temperature[1]	Wax Color
155 °F (68 °C) / 165 °F (74 °C)	02568A	148 °F (64 °C)	100 °F (38 °C)	Light Brown
175 °F (79 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
200 °F (93 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
220 °F (104 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown
286 °F (141 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown

[1] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

Viking Residential Sprinkler Installation Guide

October 25, 2018

WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov

Trusted Above All™

www.vikinggroupinc.com

VIKING	TECHNICAL DATA	FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

Viking residential automatic sprinklers are equipped with a “fast response” heat-sensitive operating element designed to respond individually and quickly to a specific high temperature. Viking residential sprinklers are designed to combine speed of operation with water distribution characteristics to help in the control of residential fires and to improve life safety by prolonging the time available for occupants to escape or be evacuated.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

A. Viking residential sprinklers are intended for use in the following occupancies: one- and two-family dwellings and mobile homes with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; or residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13. Information contained in this guide is based on NFPA 13, “Standard for the Installation of Sprinkler Systems”.

B. The design criteria for residential sprinklers contained in the NFPA installation standards must be followed except as modified by the individual UL 1626 listing information provided in the technical data pages and this Residential Sprinkler Installation Guide. For listed areas of coverage, technical data, and specific design and installation instructions, refer to the appropriate Viking technical data page for the sprinkler model used.

C. Viking residential sprinklers listed by Underwriters Laboratories, Inc. (UL) have passed fire tests designed to represent fire conditions for the sprinkler’s listed area of coverage. The standards for residential sprinkler performance and spray patterns are printed in Underwriters Laboratories Publication UL 1626, “Standard for Residential Sprinklers for Fire Protection Service”. All listed Viking residential sprinklers meet or exceed UL 1626 performance requirements and spray pattern criteria for their listed areas of coverage.

D. NFPA standards allow use of residential sprinklers with rates, design areas, areas of coverage, and minimum design pressures other than those specified in the standards when they have been listed for such specific residential installation conditions.

3. TECHNICAL DATA

Specifications:

Refer to the appropriate sprinkler technical data sheet.

Material Standards:

Refer to the appropriate sprinkler technical data sheet.

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

4. INSTALLATION

NOTE:Take care not to over-tighten the sprinkler and/or damage its operating parts!

Maximum Torque: 1/2” NPT: 14 ft-lbs. (19.0 N-m) 3/4” NPT: 20 ft-lbs. (27.1 N-m)

A. Care and Handling (also refer to Bulletin - Care and Handling of Sprinklers, Form No. F_091699.)

Sprinklers must be handled with care and protected from mechanical damage during storage, transport, handling, and after installation. Store sprinklers in a cool, dry place in their original container.

Use care when locating sprinklers near fixtures that can generate heat.

Never install sprinklers that have been dropped, damaged in any way, or exposed to temperatures exceeding the maximum ambient temperature allowed (refer to Table 1.)

Never install any glass-bulb sprinkler if the bulb is cracked or if there is a loss of liquid from the bulb. A small air bubble should be present in the glass bulb. Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed immediately. (Note: Installing glass bulb sprinklers in direct sunlight (ultraviolet light) may affect the color of the dye used to color code the bulb. This color change does not affect the integrity of the bulb.)

Viking residential sprinklers are intended for use on wet pipe residential systems only. Adequate heat must be provided for wet-pipe systems. DO NOT use Viking residential sprinklers on dry systems unless specifically allowed by recognized installation standards or the Authority Having Jurisdiction.

Residential concealed sprinklers must be installed in neutral or negative pressure plenums only!

Corrosion-resistant sprinklers must be installed when subject to corrosive atmospheres. **NOTE:** Viking residential sprinklers are not intended for use in corrosive environments.

TECHNICAL DATA

FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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TABLE 1: RESIDENTIAL SPRINKLER TEMPERATURE RATINGS

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[3]	Bulb Color
Residential Glass Bulb Style Sprinklers			
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Sprinkler Temperature Classification	**Sprinkler Nominal Temperature Rating (Fusing Point)[1]**	**Maximum Ambient Ceiling Temperature[3]**	
Residential Fusible Element Style Sprinklers			
Ordinary	165 °F (74 °C)	100 °F (38 °C)	
Sprinkler Temperature Classification	**Sprinkler Nominal Temperature Rating (Fusing Point)**	**Maximum Ambient Ceiling Temperature[3]**	**Temperature Identification Stamp**
Residential Flush Style Sprinklers			
Ordinary	165 °F (74 °C)	100 °F (38 °C)	On Cover or Sprinkler Inlet (VK476)
Intermediate	220 °F (104 °C)	150 °F (65 °C)	On Cover
Sprinkler Temperature Classification	**Sprinkler Nominal Temperature Rating (Fusing Point)**	**Maximum Ambient Ceiling Temperature[3]**	**Cover Plate Temperature Rating**
Residential Concealed Style Sprinklers			
Ordinary	135 °F (57 °C)[1], 140 °F (60 °C)[2], 155 °F (68 °C)[1], or 165 °F (74 °C)[1]	100 °F (38 °C)	135 °F (57 °C)

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector or flow shaper.

[2] The temperature rating is stamped on the sprinkler.

[3] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

B. Installation Instructions

Viking sprinklers are manufactured and tested to meet the rigid requirements of approving agencies. They are designed to be installed in accordance with recognized installation standards NFPA 13, NFPA 13R, and NFPA 13D, and any associated TIAs.

Deviation from the standards or any alteration to the sprinklers or cover plate assemblies after they leave the factory including, but not limited to: painting, plating, coating, or modification, may render the sprinklers inoperative and will automatically nullify the approval and any guarantee made by Viking.

The use of residential sprinklers may be limited due to occupancy and hazard. Residential fire protection systems must be designed and installed only by those who are completely familiar with the appropriate standards and codes, and thoroughly experienced in fire protection design, hydraulic calculations, and sprinkler system installation.

Before installation, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. Viking residential sprinklers must be installed after the piping is in place to prevent mechanical damage. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled.

1a. For frame-style sprinklers, install escutcheon (if used), which is designed to thread onto the external threads of the sprinkler*.

*Refer to the appropriate sprinkler technical data page to determine approved escutcheons for use with specific sprinkler models.

1b. For flush and concealed style sprinklers: Cut the sprinkler nipple so that the ½" or 3/4" (15 mm or 20 mm) NPT** outlet of the reducing coupling is at the desired location and centered in the opening** in the ceiling or wall.

**Size depends on the sprinkler model used. Refer to appropriate sprinkler data page.

TECHNICAL DATA

FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

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DESIGN CRITERIA

For Systems Designed to NFPA 13D or NFPA 13R: Apply the listed areas of coverage and minimum water supply requirements shown in the approval charts on the residential sprinkler data pages. The sprinkler flow rate is the minimum required discharge from each of the total number of design sprinklers as specified in NFPA 13D or NFPA 13R.

For Systems Designed to the latest edition of NFPA 13: The number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- **The flow rates given in the approval charts on the data pages for NFPA 13D and NFPA13R for each area of coverage listed, or**
- **Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13. The greatest dimension of the coverage area cannot be any greater than the maximum areas of coverage shown on the data pages.**

Flow Rates

All residential sprinklers manufactured on or after July 12, 2002 are listed with a single minimum flow rate. Where rooms have more than one sprinkler, multiple-sprinkler calculations are still required, but the first sprinkler and any additional sprinkler or sprinklers must be calculated flowing at identical minimum flow rates, based on the area of sprinkler coverage, using the minimum flow and pressure listed for the sprinkler model used.

Consult the appropriate standards and the Authorities Having Jurisdiction to determine the number of sprinklers to hydraulically calculate to verify adequate water supply for multiple-sprinkler operation.

Operating Pressure: The minimum operating pressure of any sprinkler shall be the minimum operating pressure specified by the listing, or 7 psi (0.5 bar), whichever is greater. The maximum allowable operating pressure is 175 psi (12 bar).

Areas of Coverage

If the actual area of coverage is less than the listed area of coverage, use the minimum water supply for the next larger area of coverage listed. DO NOT interpolate. Residential sprinkler systems must be hydraulically calculated according to NFPA standards to verify that the water supply is adequate for proper operation of the sprinklers. Hydraulic calculations are required to verify adequate water supply at the hydraulically most remote single sprinkler when it is operating at the minimum gpm and psi listed for single-sprinkler operation for the sprinkler model used.

Viking residential sprinklers may be listed for more than one area of coverage. Suggested practice in selecting area of coverage is to select the one that can be adequately supplied by the available water supply and still allow for the installation of as few sprinklers in a compartment as possible while observing all guidelines pertaining to obstructions and spacing. This maximizes the use of the available water supply, which is often limited on residential fire protection systems. After selecting an appropriate area of coverage, sprinklers must be spaced according to guidelines set forth in the installation standards.

Definition of "COMPARTMENT": A space completely enclosed by walls and a ceiling. Openings to an adjoining space are allowed, provided the openings have a minimum lintel depth of 8 in. (203.2 mm) from the ceiling.

Spacing Guidelines

For guidelines concerning spacing of Viking residential sprinklers near beams, obstructions, heat sources, and sloped ceilings [slopes more than a 2/12 (9.5°) pitch], refer to the Viking residential sprinkler data pages and installation guide, the appropriate NFPA standard, and the Authority Having Jurisdiction. NOTE: Sloped, beamed, and pitched ceilings could require special design features such as larger flow, or a design for more sprinklers to operate in the compartment, or both.

Distance from Walls: Install not more than one-half the listed sprinkler spacing nor less than 4" (102 mm) from walls, partitions, or obstructions as defined in the standards.

Minimum Sprinkler Spacing: The minimum distance between residential sprinklers to prevent cold soldering (i.e., the spray from one operating sprinkler onto an adjacent sprinkler that could prevent its proper activation) is 8 ft. (2.4 m).

Maximum Sprinkler Spacing: Locate adjacent sprinklers no farther apart than the listed spacing.

Deflector Position: Install frame style residential *pendent* sprinklers with the deflector between 1" and 4" (25.4 mm to 102 mm) below smooth ceilings, unless the sprinkler data page indicates otherwise. Install pendent sprinklers in the pendent position only, with the deflector oriented parallel with the ceiling or roof.

Refer to the individual listings in the residential sprinkler data pages for horizontal sidewall sprinkler deflector or sprinkler centerline distance below the ceiling. Install horizontal sidewall sprinklers in the horizontal position only below smooth ceilings, with the leading edge of the deflector or element assembly oriented parallel with the ceiling.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to the appropriate sprinkler data page. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.

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2. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet. **NOTE:** Sprinklers with protective caps or bulb shields must be contained within the caps or shields before applying pipe-joint compound or tape. *Exception: For concealed sprinklers (i.e., VK457, VK458, VK468, VK474, and VK4570) the protective cap is removed for installation.*
3. Care must be taken when installing sprinklers on CPVC and copper piping systems. Never install the sprinkler into the reducing fitting before attaching the reducing fitting to the piping. Sprinklers must be installed on CPVC systems after the reducing fitting has been installed and the primer and/or cement manufacturer's recommended curing time has elapsed. When installing sprinklers on copper piping systems, take care to brush the inside of the sprinkler supply piping and reducing fitting to ensure that no flux accumulates in the sprinkler orifice. Excess flux can cause corrosion and may impair the ability of the sprinkler to operate properly.
4. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used. DO NOT use the sprinkler deflector or fusible element to start or thread the sprinkler into a fitting.
   a. Install the sprinkler onto the piping using the special sprinkler wrench only, while taking care not to over-tighten or damage the sprinkler operating parts.
   b. Thread the flush or concealed sprinkler into the ½" or 3/4" (15 mm or 20 mm) NPT** *outlet of the coupling by turning it clockwise with the special sprinkler wrench. NOTE: For flush and concealed sprinklers with protective shells, the internal diameter of the special flush and concealed sprinkler installation wrench is designed for use with the sprinkler contained within the shell. Exception: For concealed sprinklers VK457, VK458, VK468, VK474, and VK4570 the protective cap is removed for installation, and then placed back on the sprinkler temporarily.*
5. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the installation standards.
   a. Make sure the sprinkler has been properly tightened. If a thread leak occurs, normally the unit must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal leaks, the sealing compound is washed out of the joint.
   b. **Remove plastic protective sprinkler caps or bulb shields AFTER the wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS <u>BEFORE</u> PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.
6. For residential flush sprinklers, the ceiling ring can now be installed onto the sprinkler body. Align the ceiling ring with the sprinkler body and thread on or push it on until the flange touches the ceiling. Note the maximum vertical adjustment is ½" (12,7 mm) for sprinkler VK420 and 5/8" for VK476. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipples as required.
7. For residential concealed sprinklers, the cover plate assembly can now be attached.
   a. Remove the cover plate assembly from the protective box, taking care not to damage the assembly.
   b. From below the ceiling, gently place the base of the cover plate assembly over the sprinkler protruding through the opening in the ceiling or wall.
   c. Carefully push the cover plate assembly onto the sprinkler, using even pressure with the palm of the hand, until the unfinished brass flange of the cover plate base touches the ceiling or wall.
   d. The maximum adjustment available for residential concealed sprinklers is ½" (12.7 mm) [1/4" (6.4 mm) for sprinkler VK480]. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler nipples.

NOTE: If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See Maintenance instructions below and follow all warnings and instructions.

5. OPERATION

During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector or flow shaper, forming a uniform, high-wall wetting spray pattern to extinguish or control the fire.

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6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers must be inspected on a regular basis for signs of corrosion, mechanical damage, obstructions, paint, etc. Frequency of the inspections may vary due to corrosive atmospheres, water supplies, and activity around the device.

B. Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced immediately after a specified term of service. Refer to NFPA 25 and the Authorities Having Jurisdiction for the specified period of time after which testing and/or replacement of residential sprinklers is required. Never attempt to repair or reassemble a sprinkler. Sprinklers and cover assemblies that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers and cover assemblies with identical performance characteristics.

C. The sprinkler discharge pattern is critical for proper fire protection. Nothing should be hung from, attached to, or otherwise obstruct the discharge pattern of the sprinkler. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.

D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the effected area.

1. Remove the system from service, drain all water, and relieve all pressure on the piping.

2a. For frame-style sprinklers, use the special sprinkler wrench and remove the old sprinkler by turning it counterclockwise to unthread it from the piping.

2b. For residential flush pendent and concealed style sprinklers: Remove the ceiling ring or cover plate assembly before unthreading the sprinkler body from the piping. To remove a ceiling ring, grasp it from below the ceiling and gently turn it counterclockwise. Cover plates can be removed either by gently unthreading them or pulling them off the sprinkler body (depends on the sprinkler model used). After the ceiling ring or cover plate assembly has been removed from the sprinkler, use the sprinkler wrench to unthread the sprinkler from the piping. NOTE: For flush and concealed sprinklers with protective shells, the internal diameter of the special flush and concealed sprinkler installation wrench is designed for use with the sprinkler contained within the shell. Place a plastic protective shell (from the spare sprinkler cabinet) over the sprinkler to be removed and then fit the sprinkler wrench over the shell. Exception: Concealed sprinklers VK457, VK458, VK468, VK474, and VK4570 are removed without the plastic cap.

3. Follow instructions in section 4B. Installation Instructions to install the new unit. Be sure the replacement sprinkler is the correct model and style, with the appropriate K-Factor, temperature rating, and response characteristics. A fully stocked sprinkler cabinet should be provided for this purpose. *(For flush or concealed style sprinklers, stock of spare ceiling rings or cover plates should also be available in the spare sprinkler cabinet.)*

4. Place the system back in service and secure all valves. Check for and repair all leaks.

E. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

7. AVAILABILITY

Viking Residential Sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

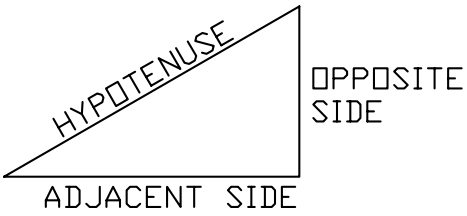
8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TECHNICAL DATA

FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

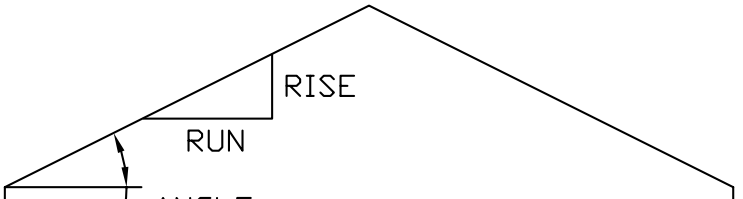


TANGENT =
OPPOSITE SIDE (RISE)
ADJACENT SIDE (RUN)

$$\frac{\text{RISE}}{\text{RUN}} = \text{TANGENT}$$

$$\text{ANGLE} = \text{TAN}^{-1}\left(\frac{\text{RISE}}{\text{RUN}}\right)$$

$$\text{SLOPE DISTANCE} = \sqrt{(\text{RISE})^2 + (\text{RUN})^2}$$



RISE	RUN	TANGENT	ANGLE	SLOPE DISTANCE
2	12	.1666	9.45°	12.1
3	12	.2500	14°	12.3
4	12	.3333	18.4°	12.6
5	12	.4166	22.6°	13
6	12	.5000	26.5°	13.4
7	12	.5833	30.2°	13.8
8	12	.6666	33.6°	14.4
9	12	.7500	36.8°	15
10	12	.8333	39.8°	15.6
11	12	.9166	42.5°	16.2
12	12	1	45°	16.97

Table 2
Rise Over Run Conversion to Degrees of Slope

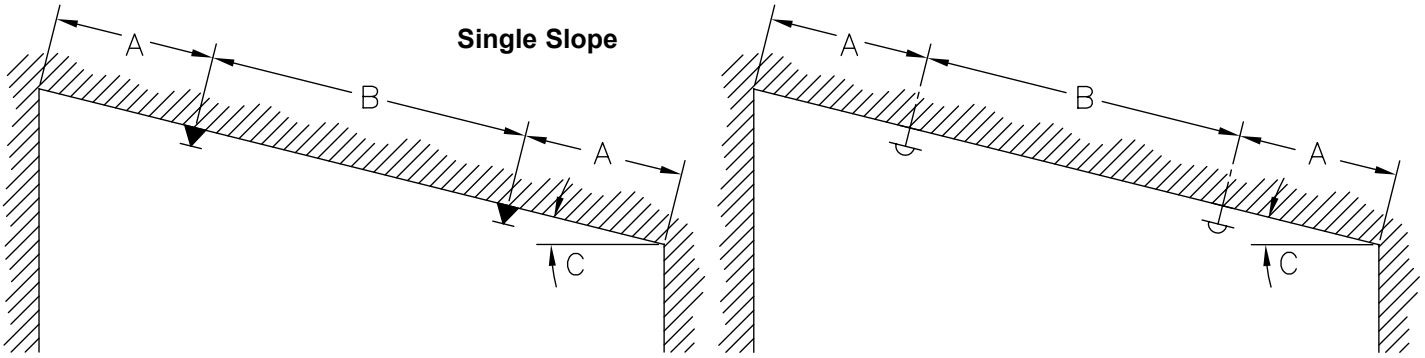
TECHNICAL DATA

FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

SPACING OF RESIDENTIAL SPRINKLERS LISTED FOR USE BELOW SLOPED CEILINGS UP TO AN 8/12 (33.7°) PITCH

(Refer to the appropriate residential sprinkler technical data page for listings.)



Pendent Sprinklers

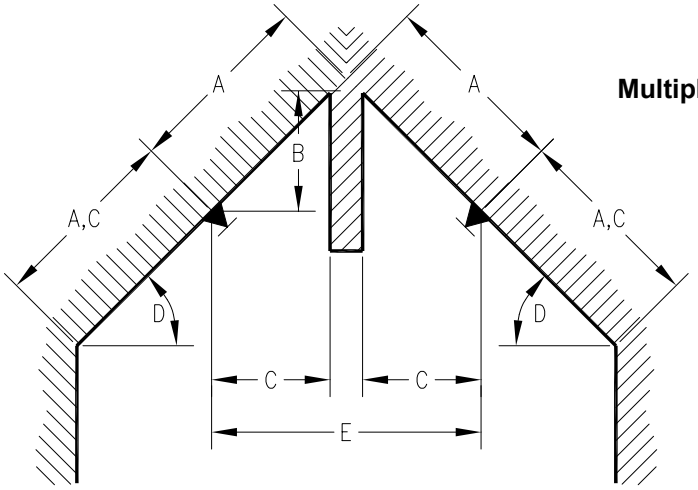
Horizontal Sidewall Sprinklers (Spray Across the Slope)

Figure 1

(A) One-half listed spacing of sprinkler maximum, 0'-4" (0-102 mm) minimum.
(B) Listed spacing of sprinkler, maximum, 8'-0" (2.4 m) minimum.
(C) Where angle "C" is greater than an 8/12 (33.7°) pitch, see Figure 2 below.

SPACING OF RESIDENTIAL SPRINKLERS BELOW SLOPED CEILINGS WITH GREATER THAN 8/12 (33.7°) PITCH

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)



Multiple Slope

Figure 2

(A) One-half listed spacing of sprinkler, maximum.
(B) 3'-0" (.91 m) maximum.
(C) 0'-4" (0-102 mm) minimum.
(D) Slopes greater than an 8/12 (33.7°) pitch.
(E) For distance less than 8'-0" (2.4 m), baffle required.

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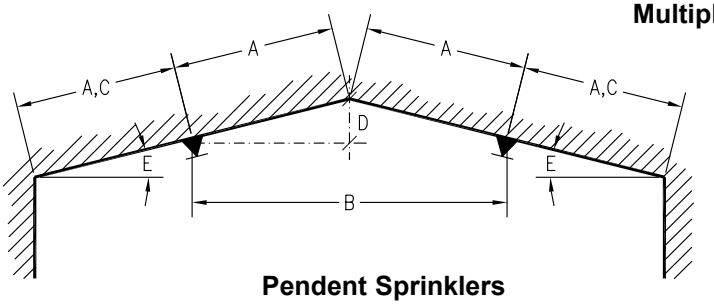
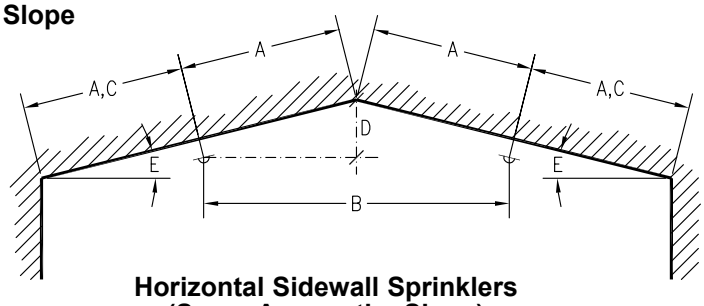
SPACING OF RESIDENTIAL SPRINKLERS LISTED FOR USE BELOW SLOPED CEILINGS UP TO AN 8/12 (33.7°) PITCH

(Refer to the appropriate residential sprinkler technical data page for listings.)

Multiple Slope



Pendent Sprinklers



Horizontal Sidewall Sprinklers (Spray Across the Slope)

Figure 3

(A) One-half listed spacing of sprinkler, maximum.
(B) 8’-0” (2.4 m) minimum.
(C) 0’-4” (0-102 mm) minimum.
(D) 3’-0” (.91 m) maximum.
(E) Acceptable for slopes of 0/12 to 8/12 (0° to 33.7°) pitch.

SPACING OF RESIDENTIAL PENDENT SPRINKLERS AT PEAK OF SLOPED CEILINGS WITH PITCH LESS THAN 8/12 (33.7°)

(Refer to the appropriate residential sprinkler technical data page for listings.)

Multiple Slope

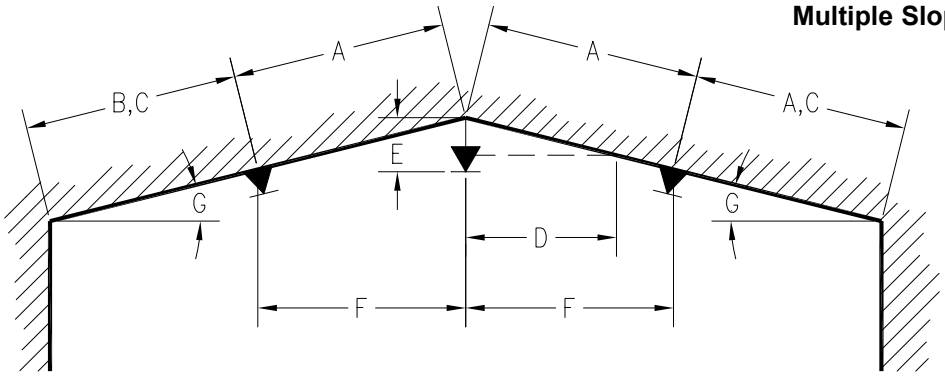


Figure 4

(A) Listed spacing of sprinkler, maximum.
(B) One-half listed spacing of sprinkler, maximum.
(C) 0’-4” minimum.
(D) Refer to page 10 for minimum distance between sprinkler and intersecting sloped ceiling.
(E) Refer to the appropriate residential sprinkler technical data page for deflector distance below ceiling.
(F) 8’-0” minimum.
(G) Reference: 4/12 (18.0°) pitch maximum for 12’ (3.7 m) spacing.
2.5/12 (12.0°) pitch maximum for 14’ (4.3 m) spacing.
2/12 (10.0°) pitch maximum for 16’ (4.9 m) spacing.
2/12 (10.0°) pitch maximum for 18’ (5.5 m) spacing.
1.9/12 (9.0°) pitch maximum for 20’ (6.1 m) spacing.
Angles based on sprinklers installed 0’-4” (0-102 mm) from peak.

NOTE: Whenever possible, utilize design as shown in Figure 3 above.

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SPACING OF RESIDENTIAL SPRINKLERS BELOW SLOPED CEILINGS WITH GREATER THAN 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 2 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

Multiple Slope

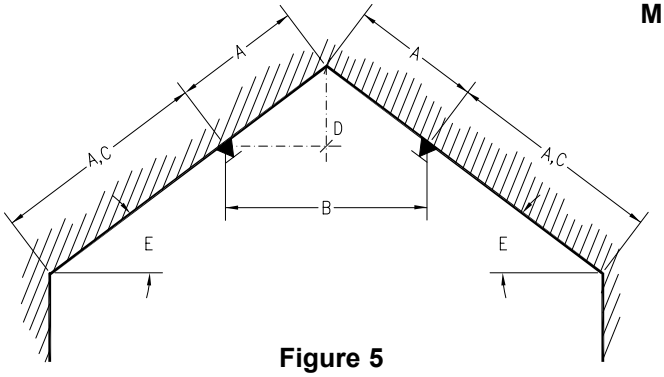

Figure 5

(A) One-half listed spacing of sprinkler, maximum.

(B) 8’-0” (2.4 m) minimum.

(C) 0’-4” (0-102 mm) minimum.

(D) 3’-0” (.91 m) maximum.

(E) Acceptable for slopes greater than an 8/12 (33.7°) pitch.

(F) When this design is used, refer to the appendices of NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction regarding the number of design sprinklers to hydraulically calculate.

SPACING OF RESIDENTIAL SPRINKLERS BELOW CEILINGS WITH SLOPES EXCEEDING 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 3 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

Multiple Slope

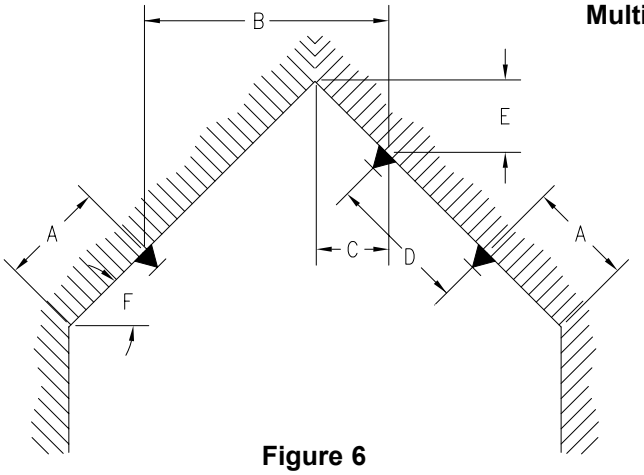

Figure 6

(A) 0’-4” (0-102 mm) minimum, to one-half listed spacing, maximum.

(B) One-half listed spacing, maximum, 8’-0” (2.4 m) minimum.

(C) 0’-4” (0-102 mm) minimum.

(D) Listed spacing maximum, 8’-0” (2.4 m) minimum.

(E) 3’-0” (.91 m) maximum.

(F) Slopes greater than 8/12 up to a 21/12 (33.7° up to 60°) pitch.

NOTES: In addition to the above limits, rooms requiring this type of installation must be hydraulically calculated to supply a minimum of three operating sprinklers. Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

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SPACING OF RESIDENTIAL SPRINKLERS BELOW CEILINGS WITH SLOPES EXCEEDING 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 2 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

Multiple Slope

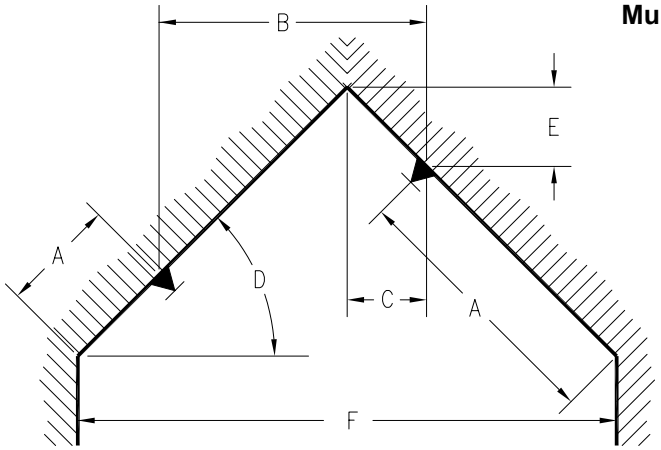


Figure 7

(A) 0'-4" (0-102 mm) minimum, to one-half listed spacing, maximum.

(B) One-half listed spacing, maximum, 8'-0" (2.4 m) minimum.

(C) 0'-4" (0-102 mm) minimum.

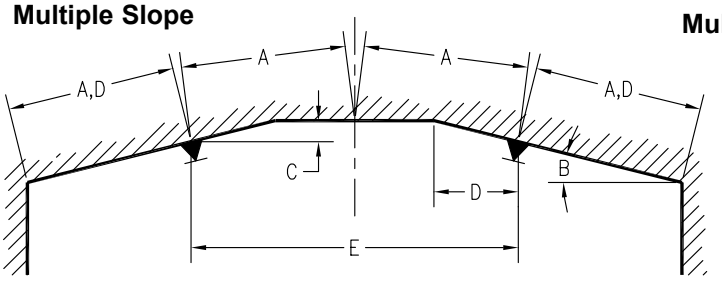
(D) Slopes greater than 8/12 pitch up to a 21/12 (33.7° up to a 60°) pitch.

(E) 3'-0" (.91 m) maximum.

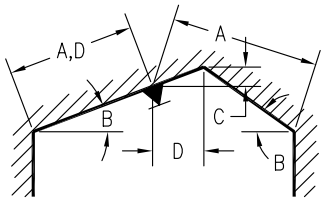
(F) When dimension "F" exceeds 16' (4.9 m), utilize design configuration shown in Figure 6.

NOTES: Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

Multiple Slope



Multiple Slope



Single Slope

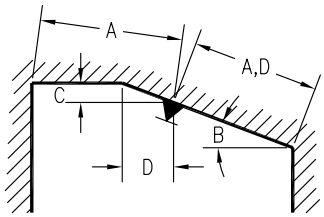


Figure 8

(A) One-half listed spacing, maximum.

(B) Refer to the appropriate residential sprinkler technical data pages for listings of sprinklers for use below slopes up to and including a 8/12 (33.7°) pitch.

(C) 3'-0" (.91 m) maximum.

(D) 0'-4" (0-102 mm) minimum.

(E) 8'-0" (2.4 m) minimum without baffle.

NOTES: Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

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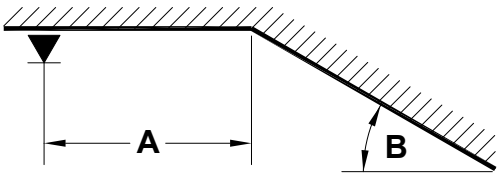
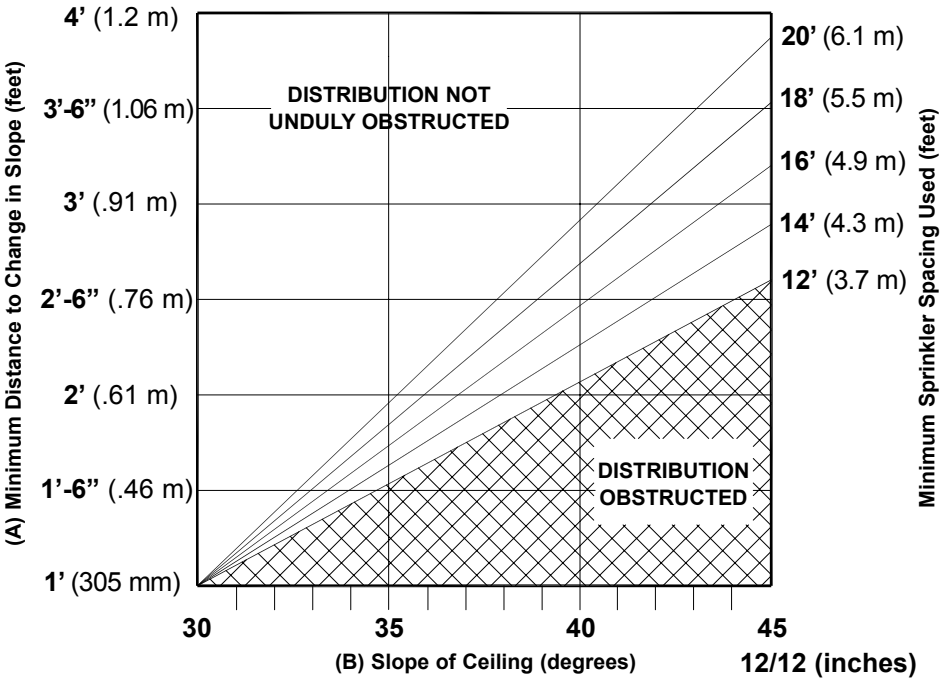
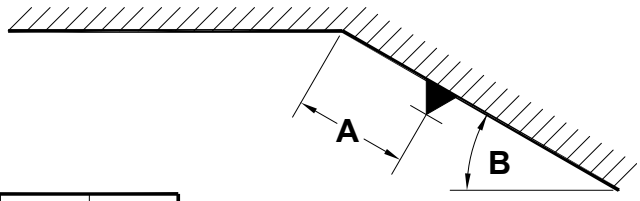
MINIMUM DISTANCE BETWEEN SPRINKLER AND INTERSECTING SLOPED CEILINGS

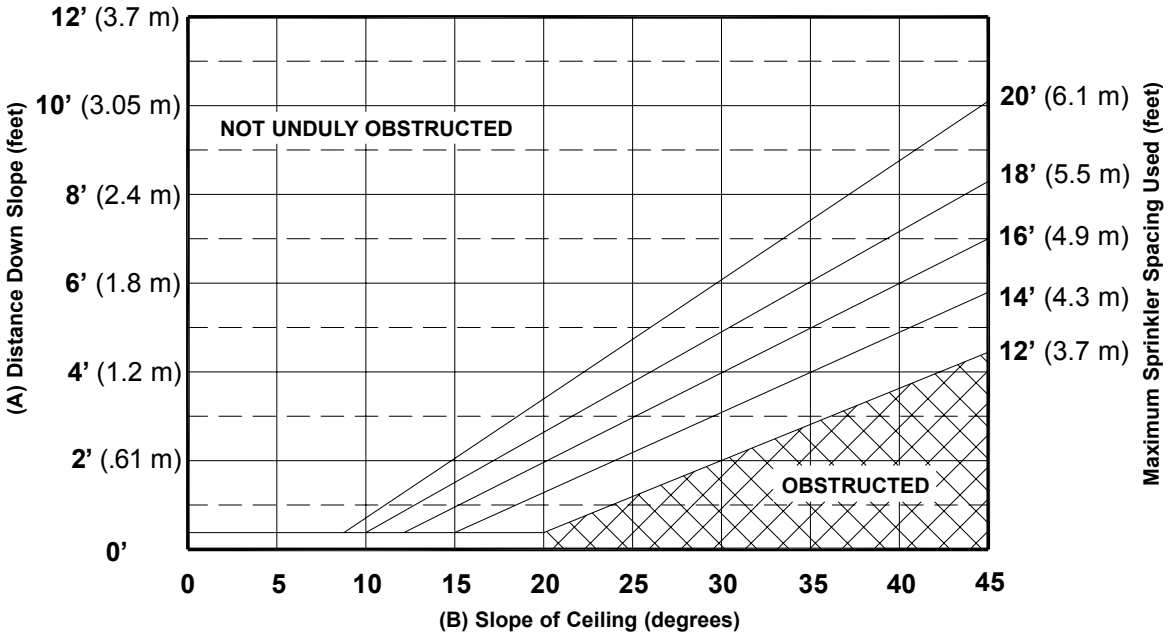


NOTES: For any ceiling slope under 7/12 (30°), distribution is considered Not Unduly Obstructed.



MAXIMUM DISTANCE DOWN SLOPE TO AVOID OBSTRUCTION TO SPRINKLER DISCHARGE





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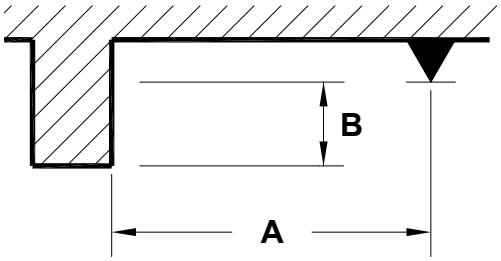
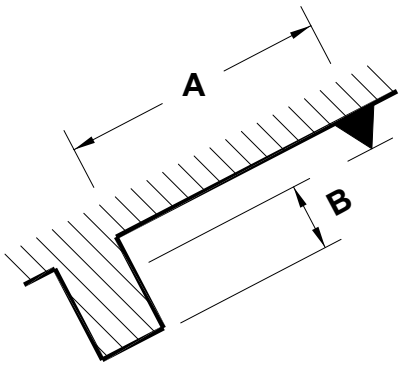
AVOIDING OBSTRUCTIONS TO SPRINKLER DISCHARGE

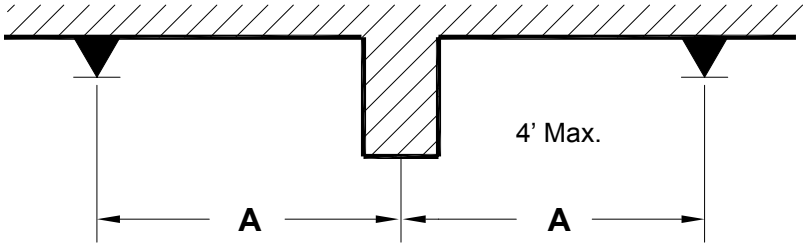
(Obstruction rules for residential sprinklers are found in section 8.10 of the 2010 edition of NFPA 13.)

Positioning Residential Pendent Sprinklers - Obstructions at the Ceiling



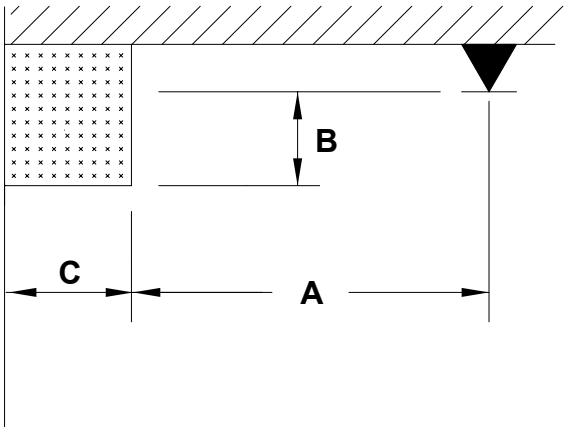


Distance from Sprinkler to Side of Ceiling Obstruction (Dimension A)	Maximum Distance from Deflector to Bottom of Ceiling Obstruction (Dimension B)	
	Inches	mm
Less than 1 ft. 6 in. (Less than 457 mm)	0	0
1 ft. 6 in. to less than 3 ft. (457 mm to less than .94 m)	1	25.4
3 ft. to less than 4 ft. (.91 m to less than 1.2 m)	3	76
4 ft. to less than 4 ft. 6 in. (1.2 m to less than 1.37 m)	5	127
4 ft. 6 in. to less than 6 ft. (1.37 m to less than 1.8 m)	7	178
6 ft. to less than 6 ft. 6 in. (1.8 m to less than 2 m)	9	229
6 ft. 6 in. to less than 7 ft. (2 m to less than 2.1 m)	11	279
7 ft. or greater (2.1 m or greater)	14	356



Residential pendent sprinklers may be located on opposite sides of continuous obstructions up to 4 ft. (1.2 m) wide at the ceiling, as long as the distance from the centerline of the obstruction to the sprinklers (A) does not exceed one-half the maximum spacing allowed between sprinklers.

Positioning Residential Pendent Sprinklers - Obstructions Along Walls



(A) Distance from centerline of sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.
(C) Width of the obstruction.

Obstructions up to 30 in. (.8 m) wide (C) located against the wall are permitted to be protected when (A) is greater than or equal to (C) minus 8 in. (.2 m) plus (B).

$C \leq 30$ in. $\quad A \geq (C - 8 \text{ in.}) + B$

for metric $C \leq .8$ m $\quad A \geq (C - .2 \text{ m}) + B$

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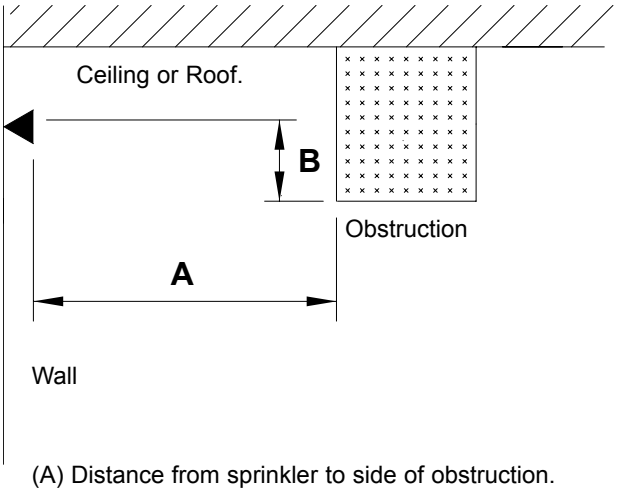
AVOIDING OBSTRUCTIONS TO SPRINKLER DISCHARGE

(Obstruction rules for residential sprinklers are found in section 8.10 of the 2010 edition of NFPA 13.)

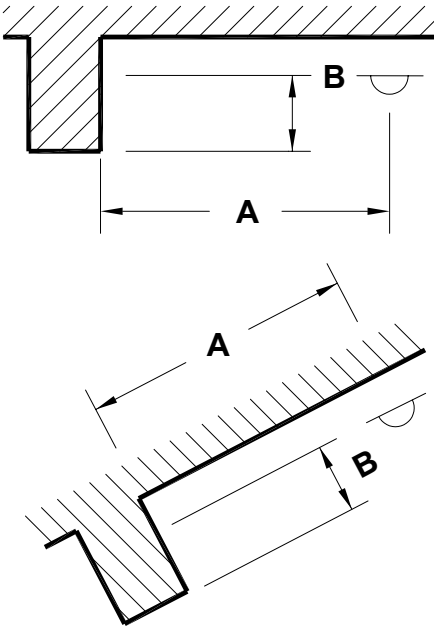
Positioning Residential Horizontal Sidewall Sprinklers - Obstructions at the Ceiling



(A) Distance from sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.

Distance from Sprinkler to Side of Ceiling Obstruction (Dimension A)	Maximum Distance from Deflector to Bottom of Ceiling Obstruction (Dimension B)	
	Inches	mm
Less than 8 ft. (Less than 2.4 m)	No Obstructions Allowed	
8 ft. to less than 10 ft. (2.4 m to less than 3.05 m)	1	25.4
10 ft. to less than 11 ft. (3.05 m to less than 3.35 m)	2	50.8
11 ft. to less than 12 ft. (3.35 m to less than 3.7 m)	3	76
12 ft. to less than 13 ft. (3.7 m to less than 4 m)	4	102
13 ft. to less than 14 ft. (4 m to less than 4.3 m)	6	152
14 ft. to less than 15 ft. (4.3 m to less than 4.6 m)	7	178
15 ft. to less than 16 ft. (4.6 m to less than 4.9 m)	9	229
16 ft. to less than 17 ft. (4.9 m to less than 5.2 m)	11	279
17 ft. or greater (5.2 m or greater)	14	356

Positioning Residential Horizontal Sidewall Sprinklers - Obstructions Along Walls



Distance from Sprinkler to Side of Obstruction Along Wall (Dimension A)	Maximum Distance from Deflector to Bottom of Obstruction (Dimension B)	
	Inches	mm
Less than 1 ft. 6 in. (Less than 457 mm)	0	0
1 ft. 6 in. to less than 3 ft. (457 mm to less than .94 m)	1	25.4
3 ft. to less than 4 ft. (.91 m to less than 1.2 m)	3	76
4 ft. to less than 4 ft. 6 in. (1.2 m to less than 1.37 m)	5	127
4 ft. 6 in. to less than 6 ft. (1.37 m to less than 1.8 m)	7	178
6 ft. to less than 6 ft. 6 in. (1.8 m to less than 2 m)	9	229
6 ft. 6 in. to less than 7 ft. (2 m to less than 2.1 m)	11	279
7 ft. or greater (2.1 m or greater)	14	356

(A) Distance from sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.

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LOCATING RESIDENTIAL SPRINKLERS NEAR HEAT SOURCES

Ordinary temperature rated residential sprinklers (135 °F to 170 °F rated) are only to be installed where the maximum ambient ceiling temperature will not exceed 100 °F. Where the maximum ambient ceiling temperature will be from 101 °F to 150 °F, use intermediate temperature rated residential sprinklers (175 °F to 225 °F rated).

Residential sprinklers must be positioned a sufficient distance away from heat sources that include fireplaces, stoves, kitchen ranges, wall ovens, hot water pipes, water heaters, furnaces and associated flues and ducts, and light fixtures. The following minimum distances must be maintained for both ordinary and intermediate temperature rated residential sprinklers as indicated.

Heat Source	Minimum Distance from Edge of Source to Ordinary Temperature Rated Sprinkler		Minimum Distance from Edge of Source to Intermediate Temperature Rated Sprinkler	
	Inches	metric	Inches	metric
Side of open or recessed fireplace	36	.91 m	12	305 mm
Front of recessed fire place	60	1.5 m	36	.91 m
Coal- or wood-burning stove	42	1.1 m	12	305 mm
Kitchen range	18	457 mm	9	229 mm
Wall oven	18	457 mm	9	229 mm
Hot air flues	18	457 mm	9	229 mm
Uninsulated heat ducts	18	457 mm	9	229 mm
Uninsulated hot water pipes	12	305 mm	6	152 mm
Side of ceiling- or wall-mounted hot air diffusers	24	.61 m	12	305 mm
Front of wall-mounted hot air diffusers	36	.91 m	18	457 mm
Hot water heater or furnace	6	152 mm	3	76 mm
Light fixture less than 250W	6	152 mm	3	76 mm
Light fixture 250W to 499W	12	305 mm	6	152 mm
Where residential sprinklers will be exposed to the rays of the sun passing through glass or plastic skylights, use intermediate temperature rated sprinklers.				
When locating residential sprinklers in an unventilated concealed compartment, under an unventilated attic or uninsulated roof, where the maximum ambient temperature does not exceed 150 °F, use intermediate temperature rated sprinklers.				

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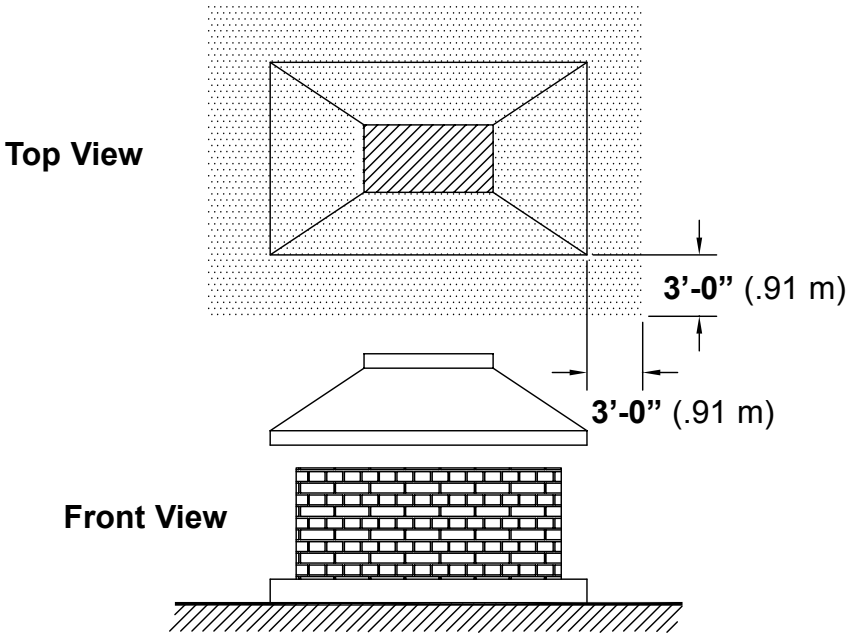
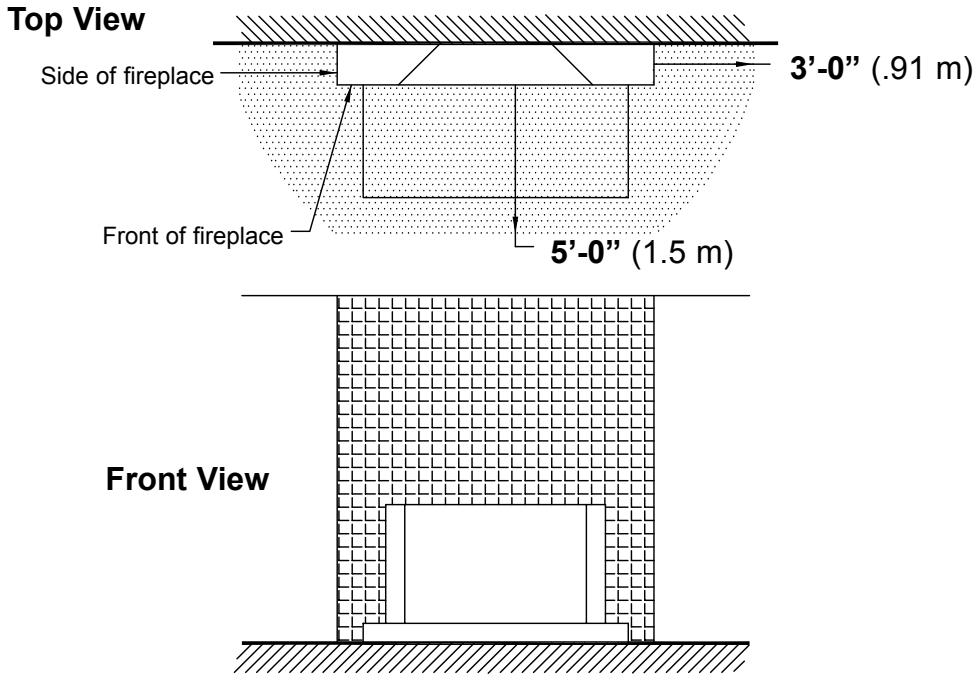
NOTE: The dimensions shown are intended to apply to residential sprinklers installed in ceilings above fireplaces used to burn products that cause elevated temperatures at or near the ceiling in areas surrounding the fireplace. The recommendations should not be construed to apply to decorative non-opening fireplaces such as gas fire units that will not cause elevated temperatures at the ceiling.



Sprinklers near an open hearth fireplace must be located outside of the shaded area or be intermediate degree rated.



Sprinklers near a recessed hearth fireplace must be located outside of the shaded area [at least 3'-0" (.91 m)] from the side of a recessed fireplace and at least 5'-0" (1.5 m) from the front) or be intermediate degree rated.

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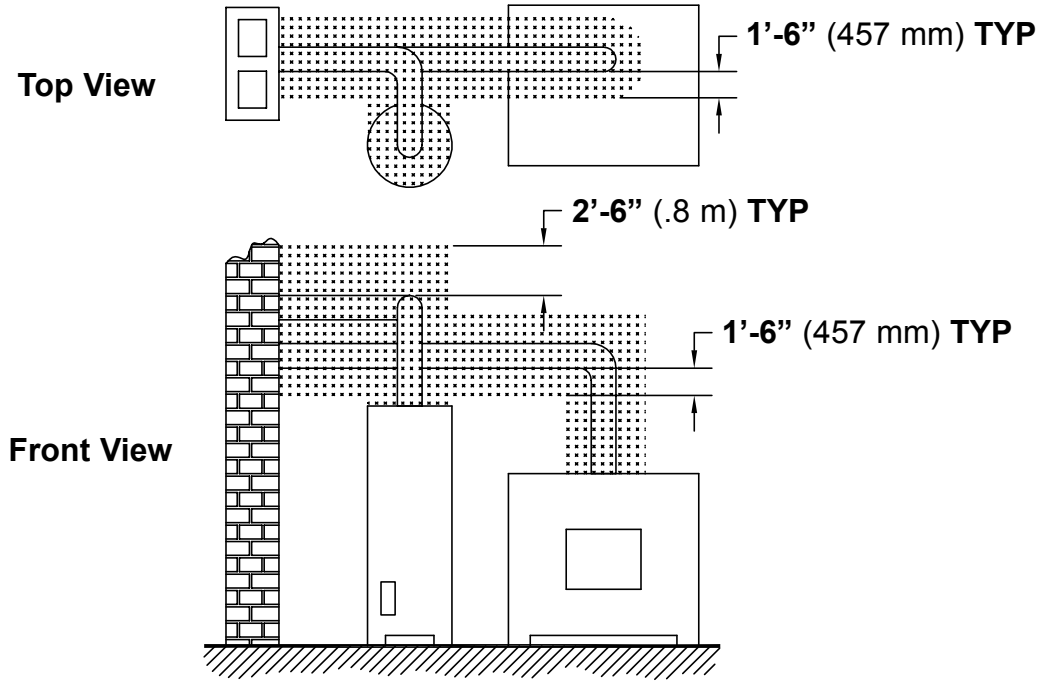
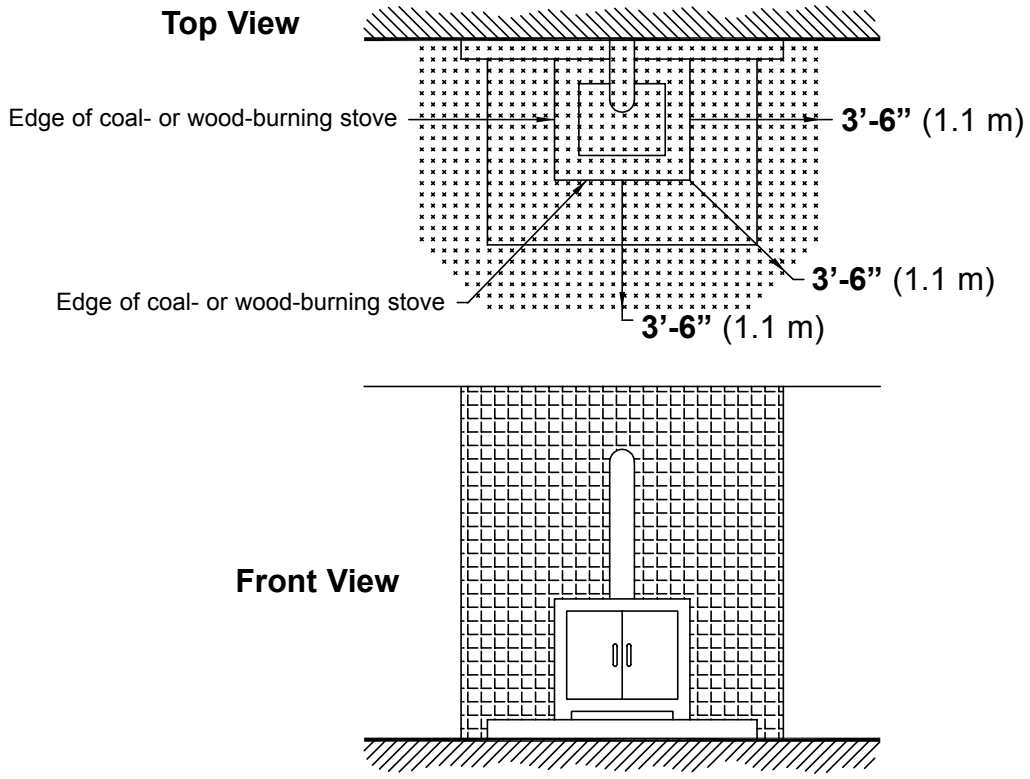


Sprinklers near a furnace or water heater must be located outside of the shaded area or be intermediate degree rated.



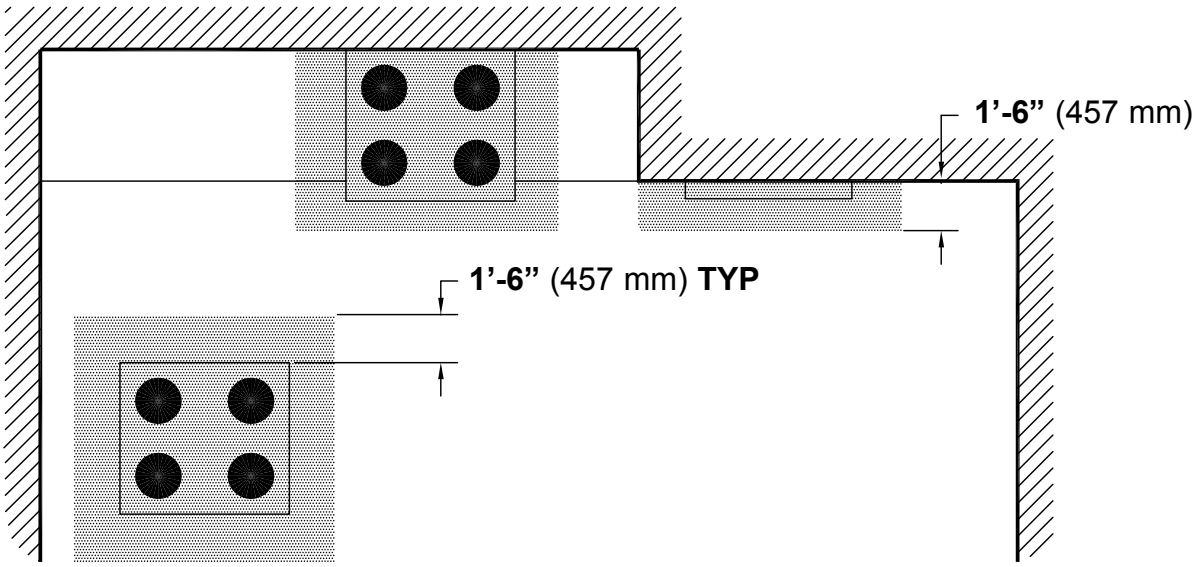
Sprinklers near a coal- or wood-burning stove must be located outside of shaded area or be intermediate degree rated.

TECHNICAL DATA

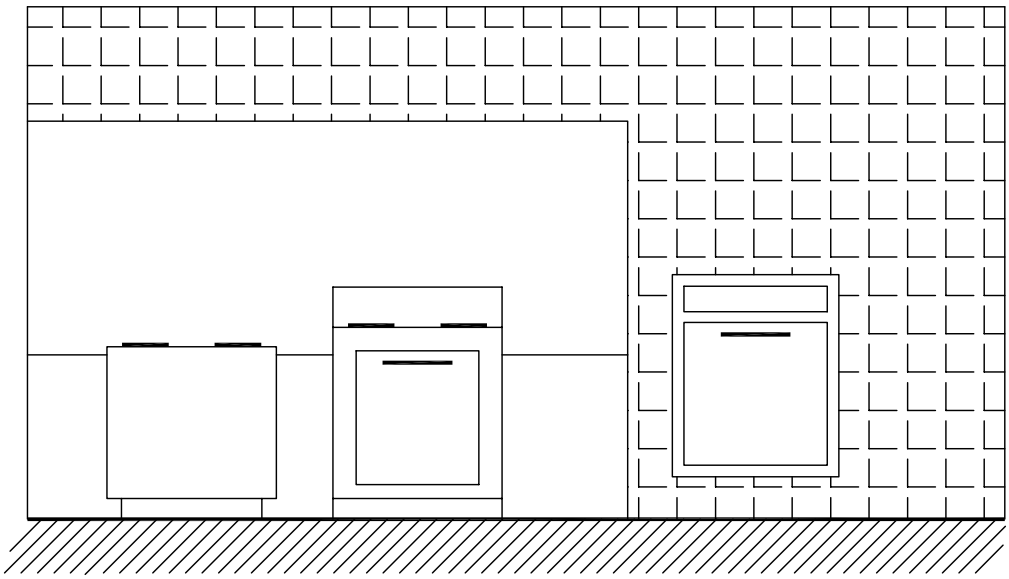
FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Top View



Front View



Sprinklers near a range or wall oven must be located outside of shaded areas or be intermediate degree rated.

Replaces pages 1-17, dated December 1, 2016.
(Added P65 Warning.)

Form No. F_080190 18.10.25 Rev 16.1.P65

BULLETIN

BEST PRACTICES FOR RESIDENTIAL SPRINKLER HANDLING & INSTALLATION

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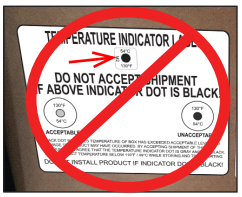
Visit the Viking website for the latest edition of this technical data page.

SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

- Always keep sprinklers in a cool dry place.
- Protect sprinklers during storage, transport and handling as well as before, during and after installation. Refer to Viking's Care and Handling of Sprinklers Bulletin Form No. F_091699[2].
- Proper transit, storage and installation of sprinklers in a high-heat environment is a must. Care should be taken to prevent sprinklers from being exposed to ambient heat conditions in excess of those referenced in installation standards.
- Do not stage or store sprinklers on the job site in advance in a non-conditioned space prior to installation.
- Keep sprinklers in the original packaging and check temperature indicators on box label prior to installation. If the indicator has turned black, DO NOT install any product contained in the box. Refer to Viking product return policies.
- Temperatures exceeding the maximum ambient temperature of the sprinkler temperature-rating during storage, transport, handling and installation must be avoided.
- Per NFPA standards 13, 13R, and 13D, sprinklers installed where maximum ambient temperatures are at or over 101 °F (38 °C) through 150 °F (66 °C) shall be intermediate temperature-rated sprinklers. Additionally, if sprinklers are installed in an unventilated concealed space under an uninsulated roof or in an unventilated attic, they shall be of intermediate temperature classification.
- Sprinklers installed where ambient temperatures are at or below 100 °F (38 °C) may be either ordinary or intermediate temperature-rated sprinklers. Refer to NFPA standards 13R 6.2.3.1 and 13D 7.5.6.1.
- Rough-in of sprinkler piping during hot weather conditions should not include the installation of sprinklers unless reasonable ambient temperatures can be maintained. Ambient temperatures that are considered when choosing the temperature rating for a sprinkler should take into account the range of ambient temperatures that are expected from installation through establishment and maintenance of temperature in a conditioned space. Appropriate insulation may be considered. **Example**: An ordinary temperature sprinkler should not be exposed to maximum ambient temperature higher than 100 °F (38 °C) or more. Refer to NFPA 13, Table 6.2.5.1, NFPA 13R, 6.2.3.1 and NFPA 13D, 7.5.6.1.
- CPVC fire sprinkler products exposed to high ambient temperatures (e.g. installed in unventilated, concealed spaces such as attics) should be insulated to maintain a cooler environment. Refer to Viking Plastics Installation and Design Manual, Form No. F_080712[2], for care and handling procedures.
- Protect all sprinklers and connecting CPVC piping in attic spaces and unvented concealed spaces from excessive heat exposure above 100 °F (38 °C). To separate excessive attic heat, properly tent and fully insulate all pipe in unconditioned spaces.
- Pressure relief valves should be installed on wet sprinkler systems where there is a risk of over-pressurization of a checked water supply, due to thermal expansion. Refer to NFPA 13, 7.1.2.1 and NFPA 13D, A.5.2.2.2.
- Fire sprinkler systems should be installed per current referenced editions of building codes and installation standards adopted in the jurisdiction where work is being performed.



INCORRECT
(Heat exposure)


INCORRECT
(Unconditioned at rough-in)


INCORRECT
(Exposed piping)


INCORRECT
(No pressure relief valve)

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

[1]Hot weather condition is defined as temperatures that can reach the maximum ambient temperature-rating of the sprinkler.
[2]Clicking on blue hyperlink will open referenced document.

⚠ WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

VIKING	TECHNICAL DATA	SPRINKLER OVERVIEW

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1. DESCRIPTION

Viking fire sprinklers consist of a threaded frame with a specific waterway or orifice size and a deflector for distributing water in a specified pattern. A closed or sealed sprinkler refers to a complete assembly, including the thermosensitive operating element. An open sprinkler does not use an operating element and is open at all times. The distribution of water is intended to extinguish a fire or to control its spread.

Viking sprinklers are available in several models and styles. Refer to specific sprinkler technical data pages for available styles, finishes, temperature ratings, thread sizes, and nominal K-Factors for the particular model selected.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

3. TECHNICAL DATA

Pressure Ratings:

Maximum allowable water working pressure is 175 psig (12 Bar) unless rated and specified for high water working pressure [250 psig (17.2 bar)].

Sprinkler Identification:

Viking sprinklers are identified and marked with the word “Viking”, the sprinkler identification number (SIN) consisting of “VK” plus a three digit number*, the model letter, and the year of manufacture.

Available Finishes:

Viking sprinklers are available in several decorative finishes. Some models are available with corrosion-resistant coatings or are fabricated from non-corrosive material. Refer to the sprinkler technical data page for additional information.

Available Temperature Ratings:

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

K-Factors:

Viking sprinklers are available in several orifice sizes with related K-Factors. The orifice is a tapered waterway and, therefore, the K-Factor given is nominal. Nominal U.S. K-Factors are provided in accordance with the 1999 edition of NFPA 13, Section 3-2.3. Refer to the specific data page for appropriate K-Factor information.

Available Styles:

Viking sprinklers are available for installation in several positions as indicated by a stamping on the deflector. The deflector style dictates the appropriate installation position of the sprinkler; it breaks the solid stream of water issuing from the sprinkler orifice to form a specific spray pattern. The following list indicates the various styles and identification of Viking sprinklers.

UPRIGHT SPRINKLER: A sprinkler intended to be installed with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSU” (Standard Sprinkler Upright) or “UPRIGHT” on the deflector.

PENDENT SPRINKLER: A sprinkler intended to be oriented with the deflector below the frame so water flows downward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSP” (Standard Sprinkler Pendent) or “PENDENT” on the deflector.

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

CONVENTIONAL SPRINKLER: An “old style” sprinkler intended to be installed with the deflector in either the upright or pendent position. The deflector provides a spherical type pattern with 40 to 60 percent of the water initially directed downward and a proportion directed upward. Must be installed in accordance with installation rules for conventional or old style sprinklers. DO NOT USE AS A REPLACEMENT FOR STANDARD SPRAY SPRINKLERS. Marked “C U/P” (Conventional Upright/Pendent) on the deflector.

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VERTICAL SIDEWALL (VSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The deflector provides a water spray pattern outward in a quarter-spherical pattern and can be installed in the upright or pendent position with the flow arrow in the direction of discharge. Marked “SIDEWALL” on the deflector with an arrow and the word “FLOW”. (Note: Some vertical sidewall sprinklers can only be installed in the upright or pendent position—in this case, the sprinkler will also be marked “UPRIGHT” or “PENDENT”.)

HORIZONTAL SIDEWALL (HSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The special deflector provides a water spray pattern outward in a quarter-spherical pattern. Most of the water is directed away from the nearby wall with a small portion directed at the wall behind the sprinkler. The top of the deflector is oriented parallel with the ceiling or roof. The flow arrows point in the direction of discharge. Marked “SIDEWALL” and “TOP” with an arrow and the word “FLOW”.

EXTENDED COVERAGE (EC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listings. Maximum area of coverage, minimum flow rate, orifice size, and nominal K-Factor are specified in the individual listings. EC sprinklers are intended for Light-Hazard occupancies with smooth, flat, horizontal ceilings unless otherwise specified. In addition to the above markings, the sprinkler is marked “EC”.

QUICK RESPONSE (QR) SPRINKLER: A spray sprinkler with a fast- actuating operating element. The use of quick response sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction (AHJ) prior to installing.

QUICK RESPONSE EXTENDED COVERAGE (QREC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listing. This is a sprinkler with an operating element that meets the criteria for quick response. QREC sprinklers are only intended for Light Hazard occupancies. The sprinkler is marked “QREC”.

FLUSH SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The unit is mounted flush with the ceiling or wall, with the fusible link exposed. Upon actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

CONCEALED SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The sprinkler is hidden from view by a cover plate installed flush with the ceiling or wall. During fire conditions, the cover plate detaches, and upon sprinkler actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

RECESSED SPRINKLER: A spray sprinkler assembly intended for installation with a concealed piping system. The assembly consists of a sprinkler installed in a decorative adjustable recessed escutcheon that minimizes the protrusion of the sprinkler beyond the ceiling or wall without adversely affecting the sprinkler distribution or sensitivity. Refer to the appropriate technical data page for allowable sprinkler models, temperature ratings, and occupancy classifications. DO NOT RECESS ANY SPRINKLER NOT LISTED FOR USE WITH THE ESCUTCHEON.

CORROSION-RESISTANT SPRINKLER: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers.

DRY SPRINKLER: A special-service sprinkler intended for installation on dry pipe systems or wet pipe systems where the sprinkler is subject to freezing temperatures. The unit consists of a sprinkler permanently secured to an extension nipple with a sealed inlet end to prevent water from entering the nipple until the sprinkler operates. The unit MUST be installed in a tee fitting. Dry upright sprinklers are marked with the “B” dimension [distance from the face of the fitting (tee) to the top of the deflector]. Dry pendent and sidewall sprinklers are marked with the “A” dimension [the distance from the face of fitting (tee) to the finished surface of the ceiling or wall].

LARGE DROP SPRINKLER: A type of special application sprinkler used to provide fire control of specific high-challenge fire hazards. Large drop sprinklers are designed to produce an umbrella-shaped spray pattern downward with a higher percentage of “large” water droplets than standard spray sprinklers. The sprinkler has an extra-large orifice with a nominal K-Factor of 11.2. Marked “HIGH CHALLENGE” and “UPRIGHT”.

EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER: A sprinkler intended to provide fire suppression of specific high-challenge fire hazards through the use of a fast response fusible link, 14.0, 16.8, or 25.2 nominal K-Factor, and special deflector. ESFR sprinklers are designed to produce high-momentum water droplets in a hemispherical pattern below the deflector. This permits penetration of the fire plume and direct wetting of the burning fuel surface while cooling the atmosphere early in the development of a high-challenge fire. Marked “ESFR” and “UPRIGHT” or “PEND”.

INTERMEDIATE LEVEL/RACK STORAGE SPRINKLER: A standard spray sprinkler assembly designed to protect its operating element from the spray of sprinklers installed at higher elevations. The assembly consists of a standard or large orifice upright or pendent sprinkler with an integral upright or pendent water shield and guard assembly. Use only those sprinklers that have been tested and listed for use with the assembly. Refer to the technical data page for allowable sprinkler models.

RESIDENTIAL SPRINKLER: A sprinkler intended for use in the following occupancies: one- and two-family dwellings with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; and where allowed by the Authority Having Jurisdiction in residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13.

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Residential sprinklers have a unique distribution pattern and utilize a “fast response” heat sensitive operating element. They enhance survivability in the room of fire origin and are designed to provide a life safety environment for a minimum of ten minutes. For this reason, residential sprinklers must not be used to replace standard sprinklers unless tested for and approved by the Authority Having Jurisdiction. In addition to standard markings, the unit is identified as “RESIDENTIAL SPRINKLER” or “RES”.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s).

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking’s current list price schedule or contact Viking directly.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers and the appropriate sprinkler general care, installation, and maintenance guide. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

VIKING®

BULLETIN

REGULATORY AND HEALTH WARNINGS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin as they relate to legally mandated jurisdictional regions.

⚠ WARNING

STATE OF CALIFORNIA, USA

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titaninum dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to **www.P65Warnings.ca.gov**

2. WARRANTY TERMS AND CONDITIONS

For details of warranty, refer to Viking's current list price schedule at **www.vikinggroupinc.com** or contact Viking directly.

Fig. 2 - Adjustable Band Hanger (B-Line B3170)
Fig. 2F - Adjustable Band Hanger Felt Lined for Copper Tubing (B-Line B3170F)

Size Range:
Fig. 2 - 2 1/2" (65mm) thru 6" (150mm) pipe
Fig. 2F - 2 1/2" (65mm) thru 6" (150mm) pipe

Material: Pre-Galvanized Steel

Function: Recommended for the suspension of non-insulated pipe or insulated pipe with B3151 shield. Fig. 2NFPA accomodates the reduced rod schedule of the National Fire Pretection Association Pamphlet 13.

Approvals: Factory Mutual Engineering Approved. Underwriters Laboratories Listed. Conforms to Federal Specification WW-H-171E & A-A-1192A Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

Standard Finish: Pre-Galvanized

Note: Available in Stainless Steel material.

Order By: Part number and finish.

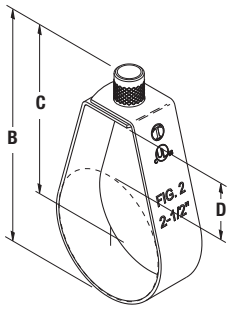


Fig. 2

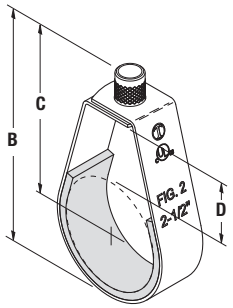


Fig. 2F

Fig. 2

Nominal Part No.	Pipe Size in.	(mm)	Rod Size A	B in.	(mm)	C in.	(mm)	D in.	(mm)	Max. Rec. Load lbs.	(kN)	Approx Wt./100 lbs.	(kg)
2-2 1/2	2 1/2"	(65)	1/2"-13 *	5 3/4"	(146.0)	4 1/4"	(107.9)	1 5/8"	(41.3)	600	(2.67)	41	(18.6)
2-3	3"	(75)	1/2"-13 *	6"	(152.4)	4 1/8"	(104.8)	1 1/4"	(31.7)	600	(2.67)	45	(20.4)
2-3 1/2	3 1/2"	(90)	1/2"-13 *	7 3/8"	(187.3)	5 1/4"	(133.3)	2 1/8"	(54.0)	600	(2.67)	52	(23.6)
2-4	4"	(100)	5/8"-11 *	7 3/8"	(187.3)	5"	(127.0)	1 5/8"	(41.3)	1000	(4.45)	59	(27.6)
2-5	5"	(125)	5/8"-11 **	9"	(228.6)	6 1/8"	(155.6)	2 1/4"	(57.1)	1250	(5.56)	97	(44.0)
2-6	6"	(150)	3/4"-10 **	9 3/8"	(238.1)	6 1/2"	(165.1)	1 7/8"	(47.6)	1250	(5.56)	139	(63.0)

Fig. 2F

Nominal Part No.	Pipe Size in.	(mm)	Rod Size A	B in.	(mm)	C in.	(mm)	D in.	(mm)	Max. Rec. Load lbs.	(kN)	Approx Wt./100 lbs.	(kg)
2F-2 1/2	2 1/2"	(65)	1/2"-13 *	5 3/4"	(146.0)	4 1/4"	(107.9)	1 5/8"	(41.3)	600	(2.67)	41	(18.6)
2F-3	3"	(75)	1/2"-13 *	6"	(152.4)	4 1/8"	(104.8)	1 1/4"	(31.7)	600	(2.67)	45	(20.4)
2F-3 1/2	3 1/2"	(90)	1/2"-13 *	7 3/8"	(187.3)	5 1/4"	(133.3)	2 1/8"	(54.0)	600	(2.67)	52	(23.6)
2F-4	4"	(100)	5/8"-11 *	7 3/8"	(187.3)	5"	(127.0)	1 5/8"	(41.3)	1000	(4.45)	59	(27.6)
2F-5	5"	(125)	5/8"-11 **	9"	(228.6)	6 1/8"	(155.6)	2 1/4"	(57.1)	1250	(5.56)	97	(44.0)
2F-6	6"	(150)	3/4"-10 **	9 3/8"	(238.1)	6 1/2"	(165.1)	1 7/8"	(47.6)	1250	(5.56)	139	(63.0)

* 3/8 nut is used when requested. ** 1/2 nut is used when requested.

5.0 Installation System Hangers

5.7 Threaded Rod and Threaded Accessories

Threaded rod

Material Specifications

Material	Low Carbon Steel, Fy = 36,000 psi; Fu = 48,000 psi Stainless Steel 316/ASTM A276 Class 1
Finish	Plain and zinc electroplated to ASTM B 633-98, SC 1 Type III

Ordering Information / Technical Data

Description	Qty (Pack)	Weight (Lb/ft)	Weight (lbs) per pkg.	Diameter (in)	Item No.	MSS-SP-58[1] Allowable Tensile Load at 650°F	AISC[2] Allowable Tensile Load (lb)
1/4" x 6' Threaded Rod (Zinc)	50	0.12	35.7	1/4-20	257963	300	780
1/4" x 10' Threaded Rod (Zinc)	50	0.12	59.5	1/4-20	309386	300	780
1/4" x 10' Threaded Rod (Plain)	50	0.12	59.5	1/4-20	309391	300	780
3/8" x 6' Threaded Rod (Zinc)	25	0.3	42.6	3/8-16	257964	730	1750
3/8" x 6' Threaded Rod (Plain)	25	0.3	42.6	3/8-16	257969	730	1750
3/8" x 10' Threaded Rod (Zinc)	25	0.3	71.3	3/8-16	309387	730	1750
3/8" x 10' Threaded Rod (Plain)	25	0.3	71.3	3/8-16	309392	730	1750
1/2" x 6' Threaded Rod (Zinc)	12	0.5	38.8	1/2-13	257965	1350	3110
1/2" x 10' Threaded Rod (Zinc)	12	0.5	61.4	1/2-13	309388	1350	3110
1/2" x 10' Threaded Rod (Plain)	12	0.5	61.4	1/2-13	309393	1350	3110
5/8" x 6' Threaded Rod (Zinc)	8	0.84	40.0	5/8-11	257966	2160	4860
5/8" x 10' Threaded Rod (Zinc)	8	0.84	66.5	5/8-11	309389	2160	4860
5/8" x 10' Threaded Rod (Plain)	8	0.84	66.5	5/8-11	309394	2160	4860
3/4" x 6' Threaded Rod (Zinc)	5	1.2	36.2	3/4-10	257967	3230	6700
3/4" x 10' Threaded Rod (Zinc)	5	1.2	60	3/4-10	309390	3230	6700
3/4" x 10' Threaded Rod (Plain)	5	1.2	60	3/4-10	309395	3230	6700

1 Per MSS-SP-58-2002, the ultimate tensile loads are based on a tensile stress of 50,000 psi multiplied by the threaded rod root area based on coarse thread UNC.
2 AISC Allowable Tensile load = 0.33 x Fu x Anom
AISC Allowable Shear load = 0.17 x Fu x Anom

Rod couplers

Material Specifications

Material	ASTM A563, Grade A carbon steel;
Finish	Zinc electroplated to ASTM B 633-98, SC 1, Type I
Thread	Class 2A fit; Class 2B thread

Ordering Information

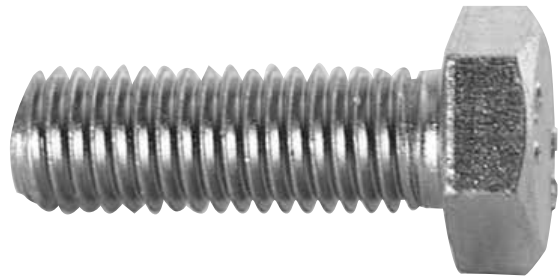
Description	Length	Width across flats	Qty	Item No.	MSS-SP-58[1] Allowable Tensile Load at 650°F	AISC[2] Allowable Load (lb)
1/4" Rod Coupler	7/8"	3/8"	100	411746	300	780
3/8" Rod Coupler	1-1/8"	1/2"	50	411747	730	1750
1/2" Rod Coupler	1-1/4"	5/8"	50	411748	1350	3110
5/8" Rod Coupler	2-1/8"	13/16"	50	411749	2160	4860
3/4" Rod Coupler	2-1/4"	1"	25	411750	3230	6700

1 Per MSS-SP-58-2002, the ultimate tensile loads are based on a tensile stress of 50,000 psi multiplied by the threaded rod root area based on coarse thread UNC.
2 AISC Allowable Tensile load = 0.33 x Fu x Anom
AISC Allowable Shear load = 0.17 x Fu x Anom

Hex head bolts

Material Specifications

Material	ASTM A 307; Stainless Steel 316
Dimensions	ASME/ANSI B18.2.1 1981
Finish	Zinc electroplated to ASTM B 633-98, SC 1, Type I
Thread	Class 2A fit; Class 2B thrd; ASME B1.1



Ordering Information

Description	Qty	Item No.
Hex Head Bolt 3/8" x 1-1/4"	100	411764
Hex Head Bolt 3/8" x 1-1/4" (SS316)	50	411788
Hex Head Bolt 3/8" x 1-1/2"	100	411765
Hex Head Bolt 3/8" x 1-1/2" (SS316)	50	411789
Hex Head Bolt 1/2" x 1"	250	311953
Hex Head Bolt 1/2" x 1" (SS316)	50	411790
Hex Head Bolt 1/2" x 1-1/4"	50	411767
Hex Head Bolt 1/2" x 1-1/4" (SS316)	50	411791
Hex Head Bolt 1/2" x 1-1/2"	50	411768
Hex Head Bolt 1/2" x 1-1/2" (SS316)	50	411792

Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series 2000SS

Double Check Valve Assemblies

Sizes: 2½" – 12"

Series 2000SS Double Check Valve Assemblies are designed to prevent the reverse flow of polluted water from entering the potable water system. This series can be applied, where approved by the local authority having jurisdiction, on non-health hazard installations. Features short end-to-end dimensions, lightweight stainless steel body, and low head loss.

2000SS-OSY-TS

Features

- Cam-Check Assembly provides low head loss
- Short lay length is ideally suited for retrofit installations
- Stainless steel body is half the weight of competitive designs reducing installation and shipping cost
- Stainless steel construction provides long term corrosion protection and maximum strength
- Single top access cover with two-bolt grooved style coupling for ease of maintenance
- No special tools required for servicing
- Compact construction allows for smaller vaults and enclosures
- May be installed in horizontal or vertical "flow up" position (ASSE Only)
- Includes an integrated supervisory tamper switch on each gate valve of the OSY model

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

NOTICE

Inquire with governing authorities for local installation requirements.

Specification

A Double Check Valve Assembly shall be installed at each noted location to prevent the unwanted reversal of polluted water into the potable water supply. The main valve body shall be manufactured from 300 series stainless steel to provide corrosion resistance, 100% lead free through the waterway. The double check shall consist of two independently operated spring loaded cam-check valves, required test cocks, and optional inlet and outlet resilient seated shutoff valves. Each cam-check shall be internally loaded and provide a positive drip tight closure against the reverse flow of liquid caused by backsiphonage or backpressure. The modular cam-check includes a stainless steel spring and cam-arm, rubber faced disc and a replaceable seat. There shall be no brass or bronze parts used within the cam-check valve assembly. The valve cover shall be held in place through the use of a single grooved style two-bolt coupling. The main assembly shall consist of two independently operating torsion spring check assemblies, two resilient seated isolation valves, and four ball valve type test cocks.

The integrated supervisory tamper switch on the OSY model shall have continuity with the valve fully open and activate within two (2) turns from open. The device consists of two SPDT switches and is designed to send a tamper signal when the valve is closed and when the switch is removed from the valve. In the neutral position, the switch indicates the valve is fully open. Closing the valve causes the switch rod to come out of the valve stem groove, activating the switch. Removing the tamper switch also activates the switch. The assembly shall be an Ames Fire & Waterworks Series 2000SS.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

AMES FIRE & WATERWORKS

A WATTS Brand

Materials

All internal metal parts: 300 Series stainless steel
Main valve body: 300 Series stainless steel
Check assembly: Noryl®
Flange dimension in accordance with AWWA Class D

Standards

AWWA C510-92, CSA B64.5

Approvals

1015 (OSY ONLY) For 12" approvals consult factory

Available Models

Suffix:

NRS – Non-rising stem resilient seated gate valves
OSY-TS – UL/FM outside stem and yoke resilient seated gate valves with integrated tamper switch
OSY FxG** – Flanged inlet gate connection and grooved outlet gate connection
OSY GxF** – Grooved inlet gate connection and flanged outlet gate connection
OSY GxG** – Grooved inlet gate connection and grooved outlet gate connection
LG – – Less gates

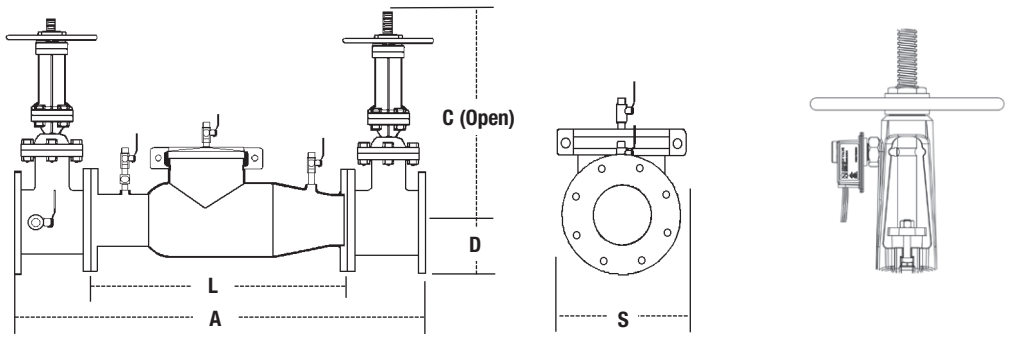
** Consult factory for the following:

– Grooved NRS gate valves
– Post-indicator plate and operating nut
– Dimensions

Pressure — Temperature

Temperature Range: 33°F – 110°F (5°C – 43°C)
Maximum Working Pressure: 175psi (12.06 bar)

Dimensions — Weights

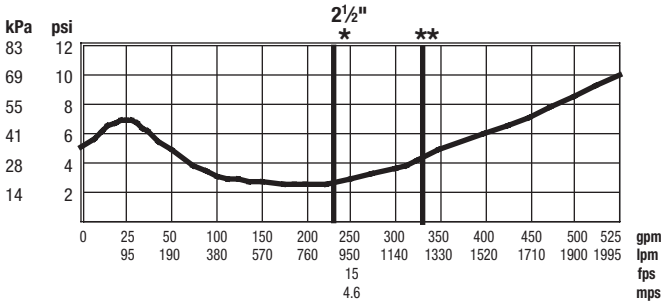


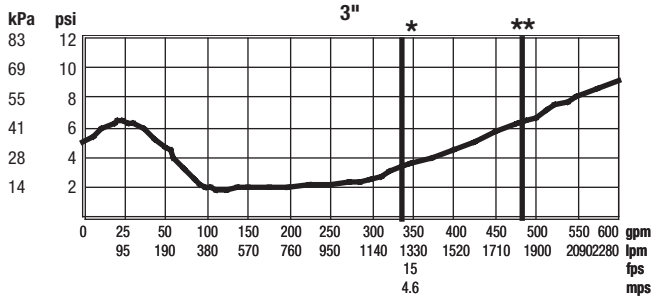
SIZE	DIMENSIONS												WEIGHT			
	A		C (OSY)		C(NRS)		D		L		S		w/Gates		w/o Gates	
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*	*lb*	*kg*
2½	37	965	16⅜	416	9⅜	238	3½	89	22	559	7	178	145	66	53	24
3	38	965	18⅞	479	10¼	260	3¾	95	22	559	7½	191	220	100	55	25
4	40	1016	22¾	578	12 3⁄16	310	4½	114	22	559	9	229	230	104	58	26
6	48½	1232	30⅛	765	16	406	5½	140	27½	699	11	279	380	172	105	48
8	52½	1334	37¾	959	19 15⁄16	506	6¾	171	29½	749	13½	343	566	256	169	77
10	55½	1410	45¾	1162	23 13⁄16	605	8	200	29½	749	16	406	768	348	179	81
12	57½	1461	53⅛	1349	26¾	679	9½	241	29½	749	19	483	1038	471	209	95

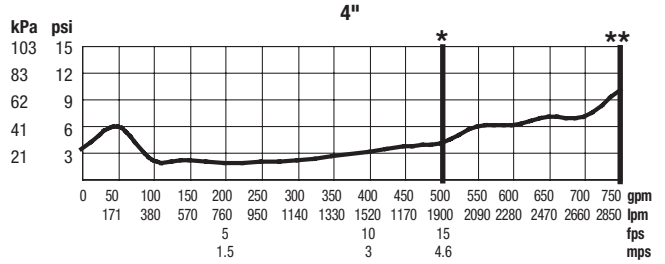
Noryl® is a registered trademark of SHPP Global Technologies B.V.

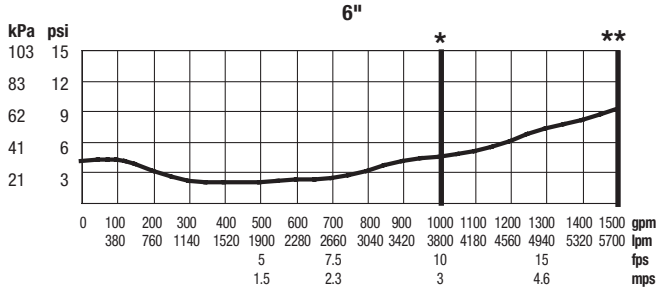
Capacity

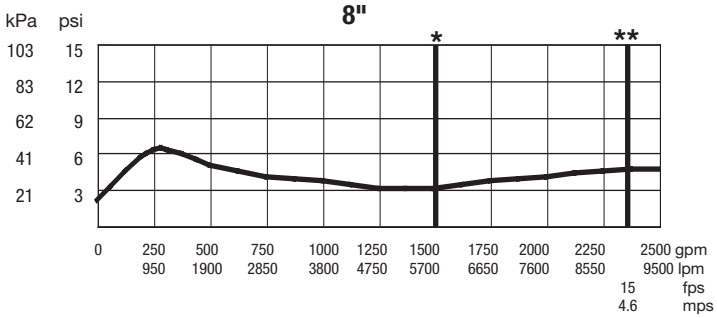
Rated working pressure 175psi (12.06 bar) * Rated flow **UL Tested

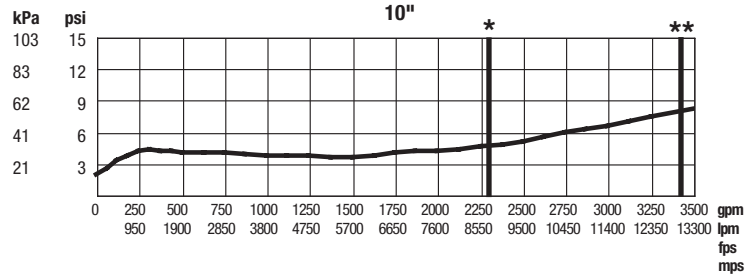


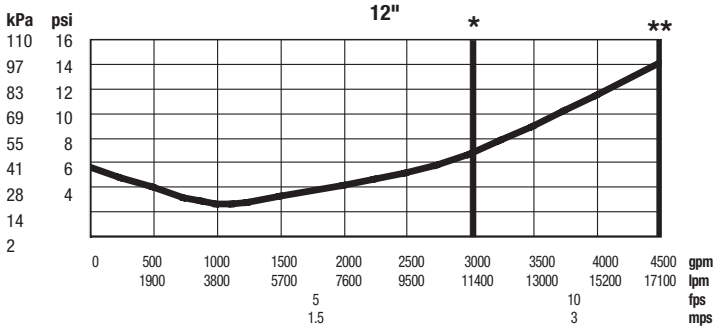












AMES
FIRE & WATERWORKS

A **WATTS** *Brand*

USA: Backflow T: (978) 689-6066 • F: (978) 975-8350 • AmesFireWater.com
USA: Control Valves T: (713) 943-0688 • F: (713) 944-9445 • AmesFireWater.com
Canada: T: (888) 208-8927 • F: (905) 481-2316 • AmesFireWater.ca
Latin America: T: (52) 55-4122-0138 • AmesFireWater.com

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Appendix D

HYDRAULIC CALCULATIONS

FOR

THE PATHWAYS STAIR CENTER
REMOTE AREA 1

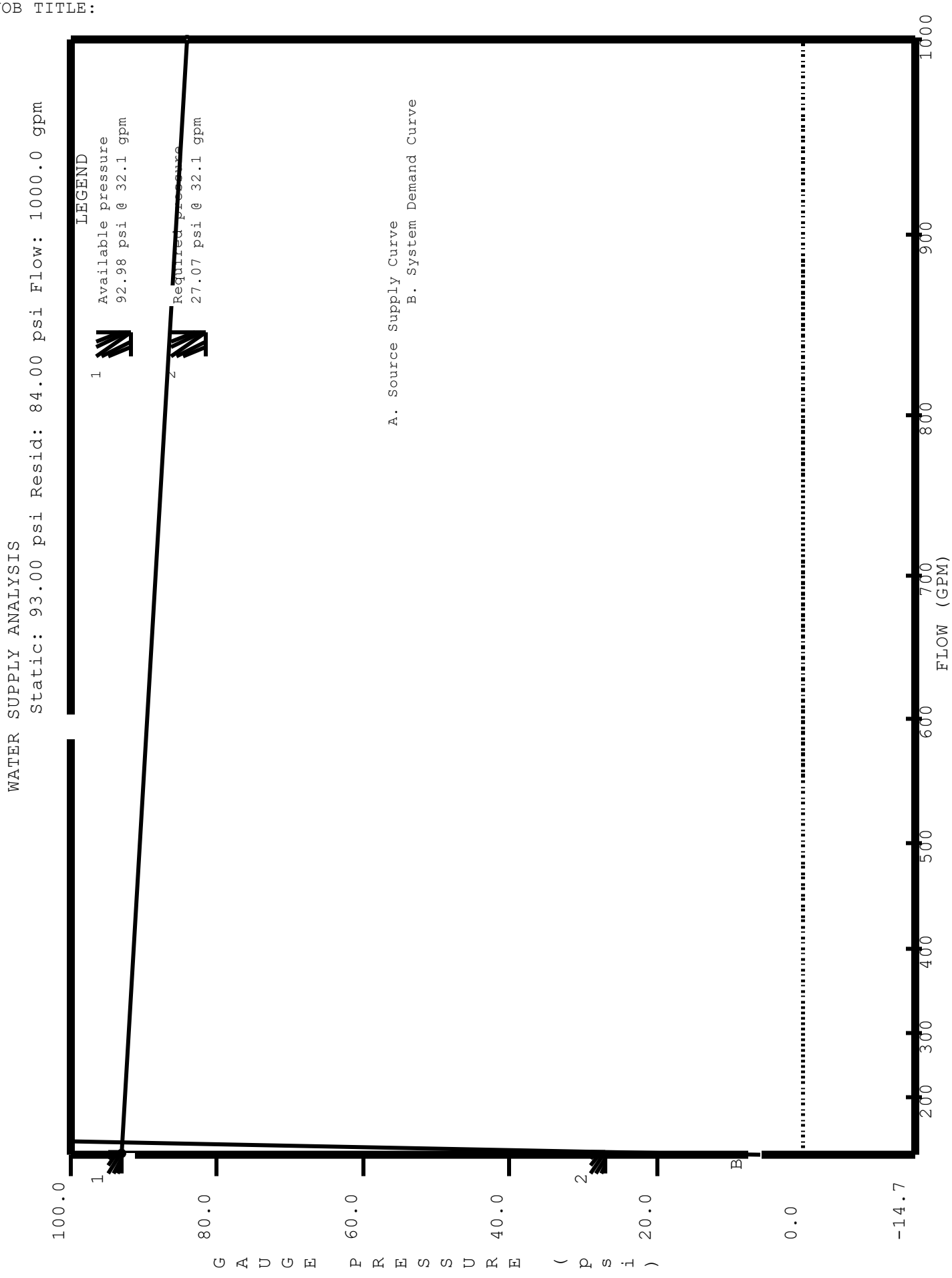
DATE: APR 21, 2023

-DESIGN DATA-

OCCUPANCY CLASSIFICATION:	Residential
DENSITY:	0.05 gpm/sq. ft.
AREA OF APPLICATION:	100 sq. ft.
COVERAGE PER SPRINKLER:	100 sq. ft.
NUMBER OF SPRINKLERS CALCULATED:	2 sprinklers
TOTAL SPRINKLER WATER FLOW REQUIRED:	32.2 gpm
TOTAL WATER REQUIRED (including hose):	32.1 gpm
FLOW AND PRESSURE (@ BOR):	32.1 gpm @ 27.07 psi
SPRINKLER ORIFICE SIZE:	1/2 inch
DESIGN/LAYOUT BY:	NICOLE WELCH, PE

CALCULATIONS BY HASS COMPUTER PROGRAM (LICENSE # 64618096)
HRS SYSTEMS, INC.

DATE: 4/21/2023PPORT\FLS\PROTECTION\NEW HYDRAULIC CALCS\REMOTE AREA 1.SDF
JOB TITLE:



Note: (1) Dashed Lines indicate extrapolated values from Test Results
(2) On Site pressures are based on hose stream deduction at the source

DATE: 4/21/2023PPORT\FLS\PROTECTION\NEW HYDRAULIC CALCS\REMOTE AREA 1.SDF
JOB TITLE:

NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	@ FLOW (GPM)	AVAIL. PRESS. (PSI)	@ TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	93.0	84.0	1000.0	93.0	32.1	27.1

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	32.1 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	32.1 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	NOTES
S01	8.7	K= 4.90	10.9	16.2	
S02	8.7	K= 4.90	10.7	16.0	
TOR	8.7	- - - -	11.7	- - -	
TORA	8.7	- - - -	11.4	- - -	
BOR	1.0	- - - -	16.1	- - -	
BORA	1.0	- - - -	15.8	- - -	
UG1	-5.0	- - - -	19.2	- - -	
UG2	-5.0	- - - -	20.6	- - -	
UG2A	-5.0	- - - -	19.0	- - -	
UG3	1.0	- - - -	18.1	- - -	
UG4	1.0	- - - -	19.3	- - -	
UG5	-5.0	- - - -	27.1	- - -	
UG6	-5.0	- - - -	27.1	- - -	
BFP1	3.0	- - - -	18.5	- - -	
BFP2	3.0	- - - -	23.5	- - -	
SOURCE	-5.0	SOURCE	27.1	32.1	

NFPA5 PIPE DATA

Pipe Tag / Frm Node / To Node	El (ft)	K-fac / PT	Add Fl (q) / Tot.(Q)	Add Fl To Node/ Disch	Nom ID / Act ID	Fit: Eq.Ln. (ft.)	L / F / T	C / Pf/ft.	(Pt) / (Pe) / (Pf)	Notes
Pipe: 1		4.90	16.2	Disch			2.00	120	0.8	
TOR	8.7	11.7	0.0		1.000	E: 2.0	7.00		-0.0	
S01	8.7	10.9	16.2		1.049	T: 5.0	9.00	0.088	0.8	
Pipe: 2		0.0	0.0				7.67	120	4.4	
BOR	1.0	16.1	16.2		1.000	C: 5.0	5.00		3.3	
TOR	8.7	11.7	16.2		1.049		12.67	0.088	1.1	
Pipe: 3		0.0	0.0				6.00	120	3.1	
UG1	-5.0	19.2	16.2	TOR	1.000	----	0.00		2.6	
BOR	1.0	16.1	16.2		1.049		6.00	0.088	0.5	
Pipe: 4		0.0	0.0				15.17	150	1.4	
UG2	-5.0	20.6	16.2	BOR	1.000	3E: 9.1	9.07		-0.0	
UG1	-5.0	19.2	16.2		1.049		24.24	0.058	1.4	
Pipe: 4A		0.0	0.0				8.58	150	-2.6	
UG3	1.0	18.1	16.2	UG1	2.000	----	0.00		-2.6	
UG2	-5.0	20.6	16.2		2.067		8.58	0.002	0.0	
Pipe: 4A1		4.90	16.0	Disch			2.00	120	0.8	
TORA	8.7	11.4	0.0		1.000	E: 2.0	7.00		-0.0	
S02	8.7	10.7	16.0		1.049	T: 5.0	9.00	0.086	0.8	
Pipe: 4A2		0.0	0.0				7.67	120	4.4	
BORA	1.0	15.8	16.0		1.000	C: 5.0	5.00		3.3	
TORA	8.7	11.4	16.0		1.049		12.67	0.086	1.1	
Pipe: 4A3		0.0	0.0				6.00	120	3.1	
UG2A	-5.0	19.0	16.0	TORA	1.000	----	0.00		2.6	
BORA	1.0	15.8	16.0		1.049		6.00	0.086	0.5	
Pipe: 4A4		0.0	0.0				12.67	120	-0.9	
UG3	1.0	18.1	16.0	BORA	1.000	E: 2.0	7.00		-2.6	
UG2A	-5.0	19.0	16.0		1.049	T: 5.0	19.67	0.086	1.7	
Pipe: 4B		0.0	16.0	UG2A			145.58	150	1.2	
UG4	1.0	19.3	16.2	UG2	2.000	2E:15.1	15.11		-0.0	
UG3	1.0	18.1	32.2		2.067		160.69	0.008	1.2	
Pipe: 4C		0.0	0.0				356.33	150	-0.7	
BFP1	3.0	18.5	32.2	UG3	4.000	5E:75.6	75.55		-0.9	
UG4	1.0	19.3	32.2		4.026		431.88	0.000	0.1	
Pipe: 4D			0.0	Fixed Pressure Loss Device						
BFP2	3.0	23.5	32.2	UG4	5.0 psi,	32.2 gpm				
BFP1	3.0	18.5	32.2							

Pipe Tag / Frm Node	El (ft)	K-fac / PT	Add Fl (q) / Tot.(Q)	Add Fl To Node/ Disch	Nom ID / Act ID	Fit: Eq.Ln. (ft.)	L / F / T	C / Pf/ft.	(Pt) (Pe) (Pf)	Notes
Pipe: 4E		0.0	0.0				90.67	150	3.5	
UG5	-5.0	27.1	32.2	BFP1	4.000	4E:60.4	90.66		3.5	
BFP2	3.0	23.5	32.2		4.026	T:30.2	181.33	0.000	0.1	
Pipe: 4F		0.0	0.0				26.50	140	0.0	
UG6	-5.0	27.1	32.2	BFP2	6.000	T:39.9	39.90		-0.0	
UG5	-5.0	27.1	32.2		6.065		66.40	0.000	0.0	
Pipe: 8		Source 0.0					21.17	140	0.0	
SOURCE	-5.0	27.1	32.1	UG5	6.000	G: 4.0	3.99		-0.0	
UG6	-5.0	27.1	32.1		6.065		25.16	0.000	0.0	

NOTES (HASS):

(1) Calculations were performed by the HASS 2023 D computer program
in accordance with (2020)
under license no. 64618096 granted by
HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760

(2) The system has been calculated to provide an average
imbalance at each node of 0.005 gpm and a maximum
imbalance at any node of 0.074 gpm.

(3) Total pressure at each node is used in balancing the system.
Maximum water velocity is 6.0 ft/sec at pipe 2.

(4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.

(5) Available pressure at source node SOURCE under full flow conditions is
92.93 psi with a flow of 73.94 gpm.

(6) PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

DATE: 4/21/2023PPORT\FLS\PROTECTION\NEW HYDRAULIC CALCS\REMOTE AREA 1.SDF
JOB TITLE:

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee
	F F45Ell								
1.049	2.00 1.00	5.00	2.00	5.00	6.00	1.00	10.00	2.00	5.00
2.067	5.00 2.50	10.00	3.00	11.00	6.00	1.00	10.00	10.00	10.00
4.026	10.00 5.00	20.00	6.00	22.00	12.00	2.00	20.00	20.00	20.00
6.065	14.00 7.00	30.00	9.00	32.00	10.00	3.00	28.00	28.00	30.00

Appendix E

STRUCTURAL ENGINEERS

Structural Calculations

City of Berkeley
2nd St Pathways Stair Center
1601 Second Street
Berkeley, CA 94720

IDA Project No. 23066

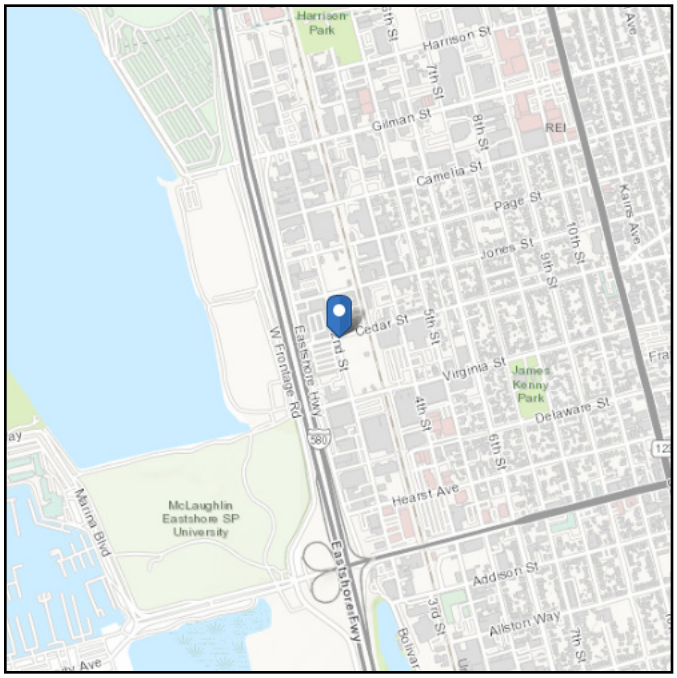
Table of Contents

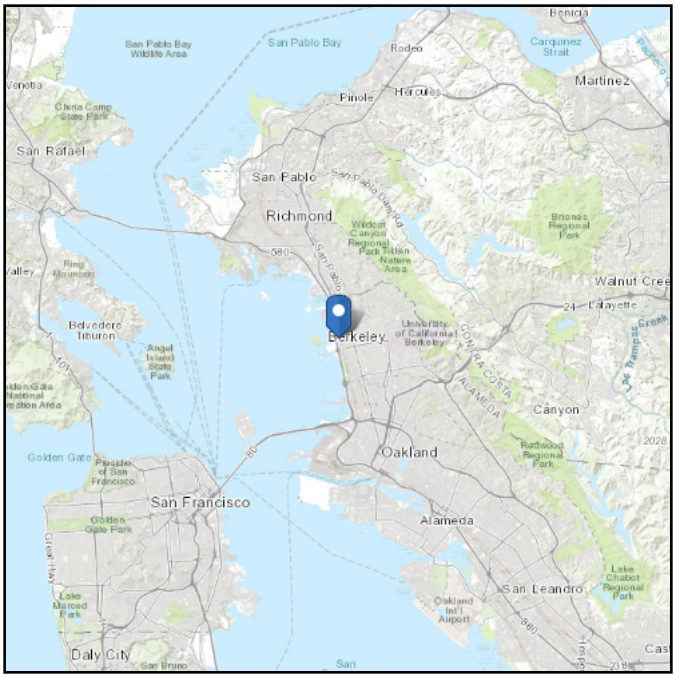
1/12/24

ASCE 7 Hazards Report

Address:
1601 2nd St
Berkeley, California
94710

Standard:	ASCE/SEI 7-16	**Latitude:**	37.873139
Risk Category:	I	**Longitude:**	-122.303971
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	9.969981641217881 ft (NAVD 88)





Wind

Results:

Wind Speed	87 Vmph
10-year MRI	64 Vmph
25-year MRI	70 Vmph
50-year MRI	74 Vmph
100-year MRI	79 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1A and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed Oct 18 2023

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (annual exceedance probability = 0.00333, MRI = 300 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.909	S_{D1} :	N/A
S_1 :	0.729	T_L :	8
F_a :	1.2	PGA :	0.802
F_v :	N/A	PGA_M :	0.963
S_{MS} :	2.291	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.527	C_v :	1.482

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed Oct 18 2023

Date Source: USGS Seismic Design Maps

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

MecaWind v2438

Calculations Prepared by:
Date: Nov 02, 2023
File Location: H:\2023 JOBS\23066 City of Berkeley 2nd St STAIR Pathways\20-29 Engineering\21 Calculations\Design Loads & Criteria\mecawind.wnd

General:

Wind Load Standard	=	ASCE 7-16	Basic Wind Speed	=	87.0 mph
Exposure Classification	=	B	Risk Category	=	I
Structure Type	=	Building	Design Basis for Wind Pressures	=	LRFD
MWFRS Analysis Method	=	Ch 27 Pt 1	C&C Analysis Method	=	None
Dynamic Type of Structure	=	Rigid	Show Advanced Options	=	True
Reset Advanced Options to Default Values	=	Defaults	Simple Diaphragm Building	=	False
Show Base Reactions in Output	=	None	Altitude above Sea Level	=	0.000 ft
Base Elevation Of Structure	=	0.000 ft	MWFRS Pressure Elevations	=	Mean Ht
Topographic Effects	=	None	Override Directionality Factor K_d	=	False
Override the Gust Factor G	=	False			

Building:

Roof Type			=	Monoslope	Enclosure Classification	=	Open
Help	=	Help on Roof Type	=	Help	Pitch = Pitch of Roof	=	3.0 :12
Slope	=	Slope of Roof	=	14.04 Deg	HtEnt = Height Entry Type	=	Mean
EHt	=	Lowest height of Roof	=	18.000 ft	H = Mean Roof Height	=	20.000 ft
RHt	=	Roof Highest Height	=	22.000 ft	L = Width Normal to Ridge	=	16.000 ft
D	=	Length Along Ridge	=	24.000 ft	Flow = Wind Flow Method	=	Clear

Exposure Constants [Table 26.11-1]:

α = 3-s Gust-speed exponent	=	7.000	Z_g= Nominal Ht of Boundary Layer	=	1200.000 ft
â = Recipicol of α	=	0.143 ft	b = 3 sec gust speed factor	=	0.840
α_m= Mean hourly Wind-Speed Exponent	=	0.250	b_m= Mean hourly Windspeed Exponent	=	0.450
c = Turbulence Intensity Factor	=	0.300	ε = Integral Length Scale Exponent	=	0.3333

Gust Factor Calculation for Wind: [Wind Dir 0 Deg]

Gust Factor Category I Rigid Structures - Simplified Method

G_1	=	For Rigid Structures (Natural Frequency > 1 Hz) use 0.85	=	0.85

Gust Factor Category II Rigid Structures - Complete Analysis

Z_m	=	Equiv Height of Struc: Max(0.6*Ht, Z_{min})	=	30.000 ft
I_{zm}	=	Intensity of Turbulence at height Z_m: c•$(33/Z_m)^{1/6}$[Eqn 26.11-1]	=	0.305
L_{zm}	=	Integeral Length Scale of Turbulence [Eqn 26.11-9]	=	309.993 ft
B	=	Building Width Width Normal to Wind Direction	=	24.000 ft
Q	=	$1/(1+0.63•[(B+Ht)/L_{zm}]^{0.63})$ [Eqn 26.11-8]	=	0.919
G_2	=	$0.925•((1+1.7•3.4•I_{zm}•Q)/(1+1.7•3.4•I_{zm}))$	=	0.877

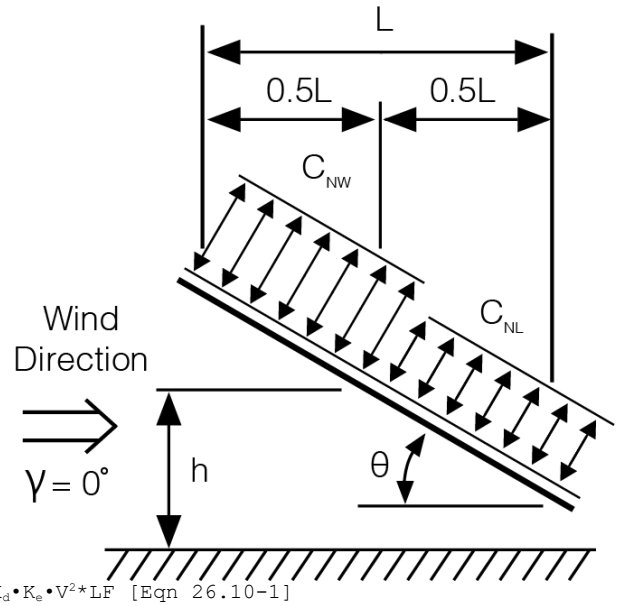
Gust Factor Used in Analysis

G	=	Gust Factor: Min(G_1, G_2)	=	0.850

Main Wind Force Resisting System (MWFRS) Wind Calculations per Ch 27 Pt1:

h	=	Mean structure height	=	20.000 ft
K_h	=	$2.01•(h/Z_g)^{2/\alpha}$[Table 26.10-1]	=	0.624
K_{zt}	=	No Topographic feature specified	=	1.000
K_d	=	Wind Directionality Factor per Table 26.6-1	=	0.85
$+GC_{pi}$	=	Open Positive Internal Pressure Table 26.13-1	=	+0.00
$-GC_{pi}$	=	Open Negative Internal Pressure Table 26.13-1	=	0.00
LF	=	Load Factor based upon STRENGTH Design	=	1.00
K_e	=	Ground Elevation Factor:$e^{-0.0000362•Z_g}$[Table 26.9-1]	=	1.000
q_h	=	$0.00256•K_h•K_{zt}•K_d•K_e•V^2$*LF [Eqn 26.10-1]	=	10.28 psf

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-4 - Wind Dir 0 Deg:



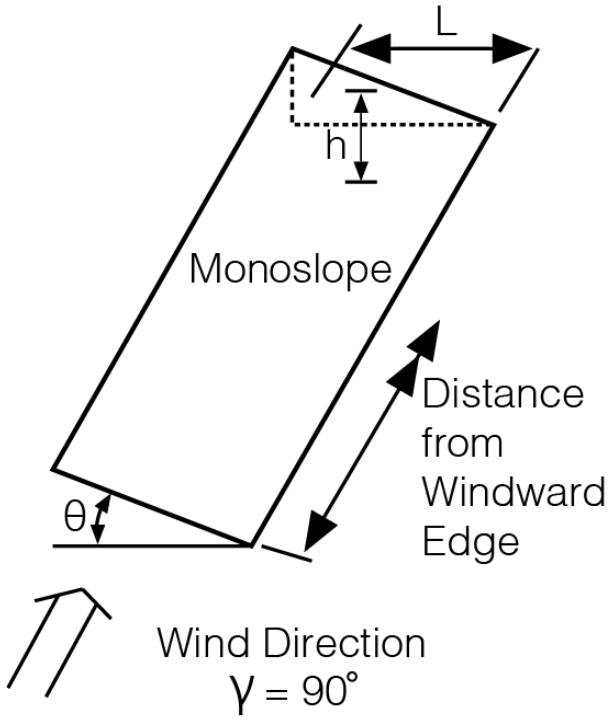
q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 10.28 psf

MWFRS Wind Pressures per Fig 27.3-4 on Monoslope Free Roof - Wind Dir 0 Deg
All wind pressures include a Load Factor (LF) of 1.0

Load Case	Cnw	Cnl	Pnw psf	Pnl psf
Load Case A	-0.861	-1.261	-7.52	-11.02
Load Case B	-1.836	0.000	-16.04	0.00

Notes:
Pnw = Pressure on windward portion of roof: $q_h \cdot G \cdot (C_{nw})$ [Eqn 27.3-2]
Pnl = Pressure On Leeward portion Of roof: $q_h \cdot G \cdot (C_{nl})$ [Eqn 27.3-2]
All wind pressures include a Load Factor (LF) of 1.0
• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-7 - Wind Dir 90 Deg:



q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 10.28 psf

MWFRS Wind Pressures per Fig 27.3-7 - Wind 90 Deg
All wind pressures include a Load Factor (LF) of 1.0

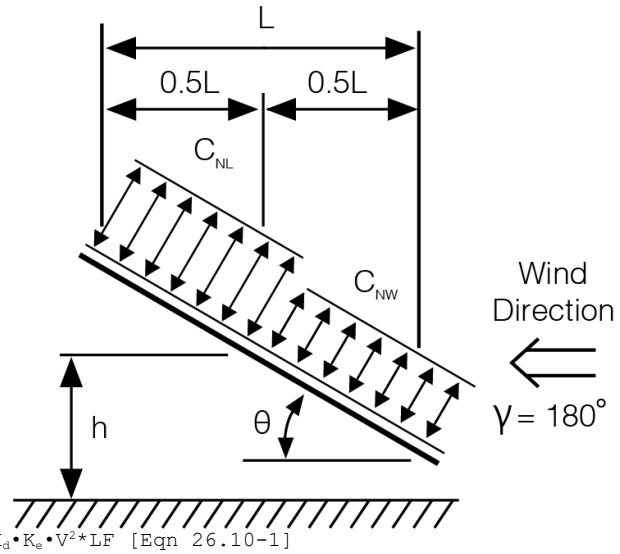
Roof Var	Start Dist ft	End Dist ft	CnA	CnB	Pressure PnA psf	Pressure PnB psf
Roof	0.000	20.000	-0.800	0.800	-6.99	6.99
Roof	20.000	40.000	-0.600	0.500	-5.24	4.37

Notes Roof Pressures:

Start	*= Start Dist from Windward Edge*	*End*	*= End Dist from Windward Edge*
CnA	*= Cn for Load Case A*	*CnB*	*= Cn for Load Case B*
PnA	*= q_h•G•(CnA) [Eqn 27.3-2]*	*PnB*	*= q_h•G•(CnB) [Eqn 27.3-2]*

• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-4 - Wind Dir 180 Deg:



q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 10.28 psf

MWFRS Wind Pressures per Fig 27.3-4 on Monoslope Free Roof - Wind Dir 180 Deg
All wind pressures include a Load Factor (LF) of 1.0

Load Case	Cnw	Cnl	Pnw psf	Pnl psf
Load Case A	1.249	1.587	10.91	13.86
Load Case B	1.774	0.561	15.50	4.90

Notes:
Pnw = Pressure on windward portion of roof: $q_h \cdot G \cdot (C_{nw})$ [Eqn 27.3-2]
Pnl = Pressure On Leeward portion Of roof: $q_h \cdot G \cdot (C_{nl})$ [Eqn 27.3-2]
All wind pressures include a Load Factor (LF) of 1.0
• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

MecaWind v2438

Calculations Prepared by:
Date: Nov 01, 2023
File Location: H:\2023 JOBS\23066 City of Berkeley 2nd St STAIR Pathways\20-29 Engineering\21 Calculations\Design Loads & Criteria\mecawind.wnd

General:

Wind Load Standard	=	ASCE 7-16	Basic Wind Speed	=	87.0 mph
Exposure Classification	=	B	Risk Category	=	I
Structure Type	=	Building	Design Basis for Wind Pressures	=	ASD
MWFRS Analysis Method	=	Ch 27 Pt 1	C&C Analysis Method	=	None
Dynamic Type of Structure	=	Rigid	Show Advanced Options	=	False

Building:

Roof Type			=	Monoslope	Enclosure Classification	=	Open
Help	=	Help on Roof Type	=	Help	Pitch = Pitch of Roof	=	3.0 :12
Slope	=	Slope of Roof	=	14.04 Deg	HtEnt = Height Entry Type	=	Mean
EHt	=	Lowest height of Roof	=	18.000 ft	H = Mean Roof Height	=	20.000 ft
RHt	=	Roof Highest Height	=	22.000 ft	L = Width Normal to Ridge	=	16.000 ft
D	=	Length Along Ridge	=	24.000 ft	Flow = Wind Flow Method	=	Clear

Exposure Constants [Table 26.11-1]:

α = 3-s Gust-speed exponent	=	7.000	z_g= Nominal Ht of Boundary Layer	=	1200.000 ft
$\hat{a}$ = Recipicol of α	=	0.143 ft	b = 3 sec gust speed factor	=	0.840
α_m= Mean hourly Wind-Speed Exponent	=	0.250	b_m= Mean hourly Windspeed Exponent	=	0.450
c = Turbulence Intensity Factor	=	0.300	ε = Integral Length Scale Exponent	=	0.3333

Gust Factor Calculation for Wind: [Wind Dir 0 Deg]

Gust Factor Category I Rigid Structures - Simplified Method

G_1	=	For Rigid Structures (Natural Frequency > 1 Hz) use 0.85	=	0.85

Gust Factor Category II Rigid Structures - Complete Analysis

Z_m	=	Equiv Height of Struc: Max(0.6*Ht, Z_{min})	=	30.000 ft
I_{zm}	=	Intensity of Turbulence at height Z_m: $c\cdot(33/Z_m)^{1/6}$ [Eqn 26.11-1]	=	0.305
L_{zm}	=	Integeral Length Scale of Turbulence [Eqn 26.11-9]	=	309.993 ft
B	=	Building Width Width Normal to Wind Direction	=	24.000 ft
Q	=	$1/(1+0.63\cdot[(B+Ht)/L_{zm}]^{0.63})$ [Eqn 26.11-8]	=	0.919
G_2	=	$0.925\cdot((1+1.7\cdot3.4\cdot I_{zm}\cdot Q)/(1+1.7\cdot3.4\cdot I_{zm}))$	=	0.877

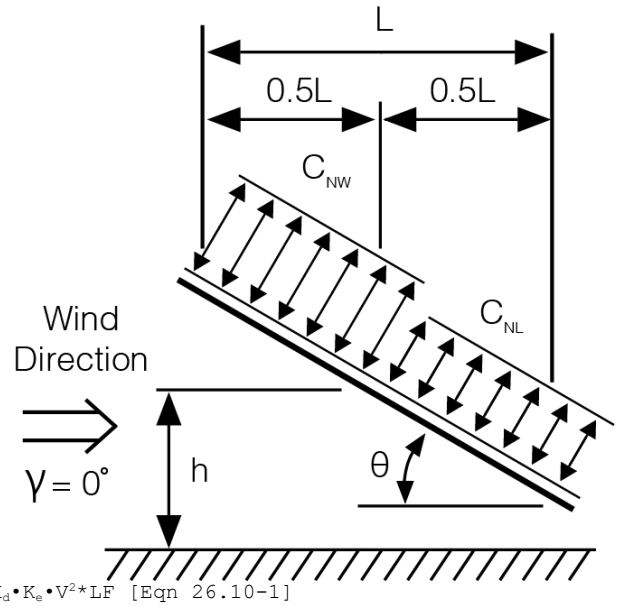
Gust Factor Used in Analysis

G	=	Gust Factor: Min(G_1, G_2)	=	0.850

Main Wind Force Resisting System (MWFRS) Wind Calculations per Ch 27 Pt1:

h	=	Mean structure height	=	20.000 ft
K_h	=	$2.01\cdot(h/Z_g)^{2/\alpha}$ [Table 26.10-1]	=	0.624
K_{zt}	=	No Topographic feature specified	=	1.000
K_d	=	Wind Directionality Factor per Table 26.6-1	=	0.85
$+GC_{pi}$	=	Open Positive Internal Pressure Table 26.13-1	=	+0.00
$-GC_{pi}$	=	Open Negative Internal Pressure Table 26.13-1	=	0.00
LF	=	Load Factor based upon ASD Design	=	0.60
K_e	=	Ground Elevation Factor:$e^{-0.0000362\cdot z_g}$ [Table 26.9-1]	=	1.000
q_h	=	$0.00256\cdot K_h\cdot K_{zt}\cdot K_d\cdot K_e\cdot V^2*LF$ [Eqn 26.10-1]	=	6.17 psf

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-4 - Wind Dir 0 Deg:



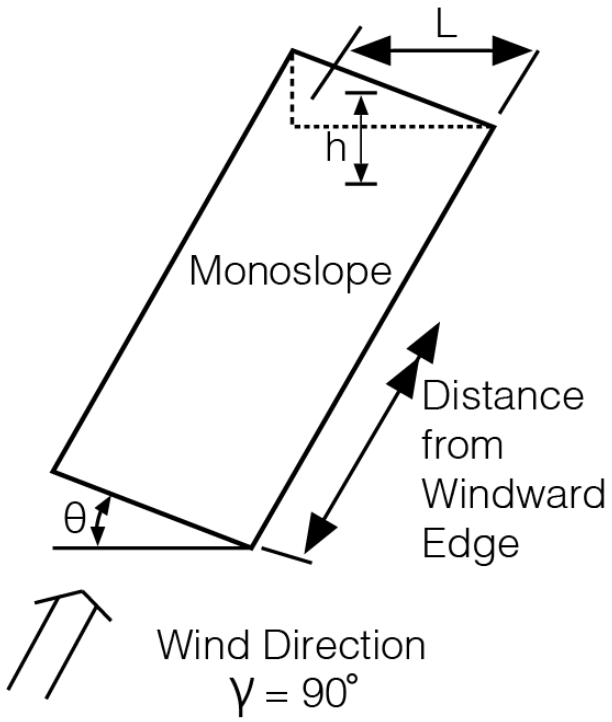
q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 6.17 psf

MWFRS Wind Pressures per Fig 27.3-4 on Monoslope Free Roof - Wind Dir 0 Deg
All wind pressures include a Load Factor (LF) of 0.6

Load Case	Cnw	Cnl	Pnw psf	Pnl psf
Load Case A	-0.861	-1.261	-4.51	-6.61
Load Case B	-1.836	0.000	-9.62	0.00

Notes:
Pnw = Pressure on windward portion of roof: $q_h \cdot G \cdot (C_{nw})$ [Eqn 27.3-2]
Pnl = Pressure On Leeward portion Of roof: $q_h \cdot G \cdot (C_{nl})$ [Eqn 27.3-2]
All wind pressures include a Load Factor (LF) of 0.6
• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-7 - Wind Dir 90 Deg:



q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 6.17 psf

MWFRS Wind Pressures per Fig 27.3-7 - Wind 90 Deg
All wind pressures include a Load Factor (LF) of 0.6

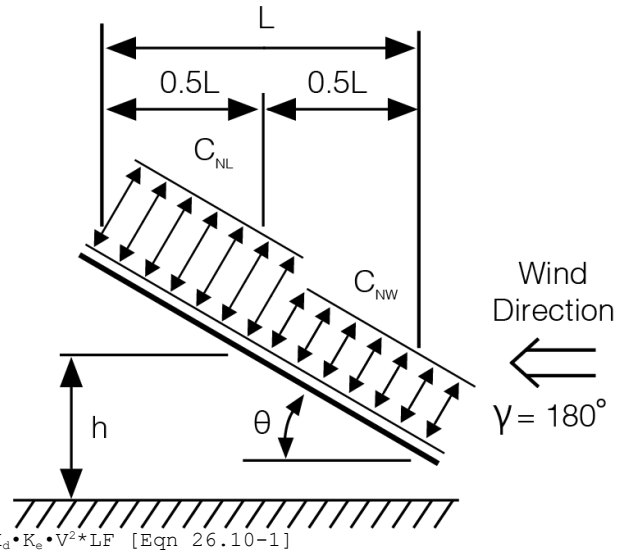
Roof Var	Start Dist ft	End Dist ft	CnA	CnB	Pressure PnA psf	Pressure PnB psf
Roof	0.000	20.000	-0.800	0.800	-4.19	4.19
Roof	20.000	40.000	-0.600	0.500	-3.14	2.62

Notes Roof Pressures:

Start	*= Start Dist from Windward Edge*	*End*	*= End Dist from Windward Edge*
CnA	*= Cn for Load Case A*	*CnB*	*= Cn for Load Case B*
PnA	*= q_h•G•(CnA) [Eqn 27.3-2]*	*PnB*	*= q_h•G•(CnB) [Eqn 27.3-2]*

• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

Wind Pressures on Open Building Monoslope Free Roof per Fig 27.3-4 - Wind Dir 180 Deg:



q_h = $0.00256 \cdot K_h \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 * LF$ [Eqn 26.10-1] = 6.17 psf

MWFRS Wind Pressures per Fig 27.3-4 on Monoslope Free Roof - Wind Dir 180 Deg
All wind pressures include a Load Factor (LF) of 0.6

Load Case	Cnw	Cnl	Pnw psf	Pnl psf
Load Case A	1.249	1.587	6.54	8.32
Load Case B	1.774	0.561	9.30	2.94

Notes:
Pnw = Pressure on windward portion of roof: $q_h \cdot G \cdot (C_{nw})$ [Eqn 27.3-2]
Pnl = Pressure On Leeward portion Of roof: $q_h \cdot G \cdot (C_{nl})$ [Eqn 27.3-2]
All wind pressures include a Load Factor (LF) of 0.6
• Positive Pressures Act TOWARD Surface and Negative Pressures Act AWAY from Surface

STRUCTURAL ENGINEERS

Subject:	Lateral Analysis and Design	**Job Number:**	23066.0	**Date:**	1/12/24
Job:	City of Berkeley - Pergola Design	**Engr:**	MLL	**Page:**	

BUILDING BASE SHEAR AND LATERAL DESIGN:
2019 California Building Code (CBC) Equivalent Lateral Force Procedure Base Shear & Vertical Force Distribution
Based on ASCE 7-16 as amended by the 2019 CBC. All references are made to ASCE 7-16, unless otherwise noted.

Seismic Base Shear

Input Data:

Site Class =	D		Geotechnical Report
Nature of Occupancy =	Bldgs w/ Low Hazard to Human Life		Per Architect
Risk / Occupancy Category =	I		Table 1.5-1
Seismic Design Category based on S_{D1}=	D		CBC, 1613.2.5
Seismic Design Category based on S_{DS}=	D		CBC, 1613.2.5
Governing Seismic Design Category =	**D**		CBC, 1613.2.5
Short Period, S_s =	1.91	g	US Seismic Maps
Site Coefficient, F_A =	1.20		Table 11.4-1
Maximum Considered Earthquake, S_{MS} =	2.29	g	Eqn 11.4-1
Damped Short Period Acceleration, S_{DS} =	1.53	g	Eqn 11.4-3
One Second Period, S_1 =	0.73	g	US Seismic Maps
Site Coefficient, F_V =	1.57		Table 11.4-2
Maximum Considered Earthquake, S_{M1} =	1.15	g	Eqn 11.4-2
Damped One Second Period Acceleration, S_{D1} =	0.76	g	Eqn 11.4-4
Importance factor, I =	1.00		Table 1.5-2
Siesmic Force-Resisting System =	Timber Frame Cantilever Column System		
Design Modification Coefficient, R =	1.5		Table 12.2-1
Period Determination Exponent , x =	0.75		Table 12.8-2
Building System Coefficient, C_t =	0.02		Table 12.8-2
Total Building Height, h =	12	ft	
Approx Fundamental Period of Vibration, T_a =	0.13		Eq 12.8-7
Long-period Transition Period =	8		US Seismic Maps

Calculation of Seismic Response Coefficient (at strength level):

A)	$C_S = S_{DS} * I / R$		Eqn 12.8-2
	V = 1.018 *WT		
B)	$C_s \leq S_{D1} * I / (T * R)$ for $T \leq T_L$		Eqn 12.8-3
	V = 3.947 *WT		
C)	Minimum C_s:		Eqn 12.8-5
	V = 0.07 *WT		
D)	$C_S \geq 0.5 * S_1 * I / R$ for S_1 >=0.6 g		Eqn 12.8-6
	V = 0.243 *WT		
Governing Base Shear:	V = 1.018 *WT		At Strength Level

Lateral Analysis is completed using the Allowable Stress Design Procedure:

At Allowable Stress Level:	**V = 0.713 *WT**	Section 2.4.1

STRUCTURAL ENGINEERS

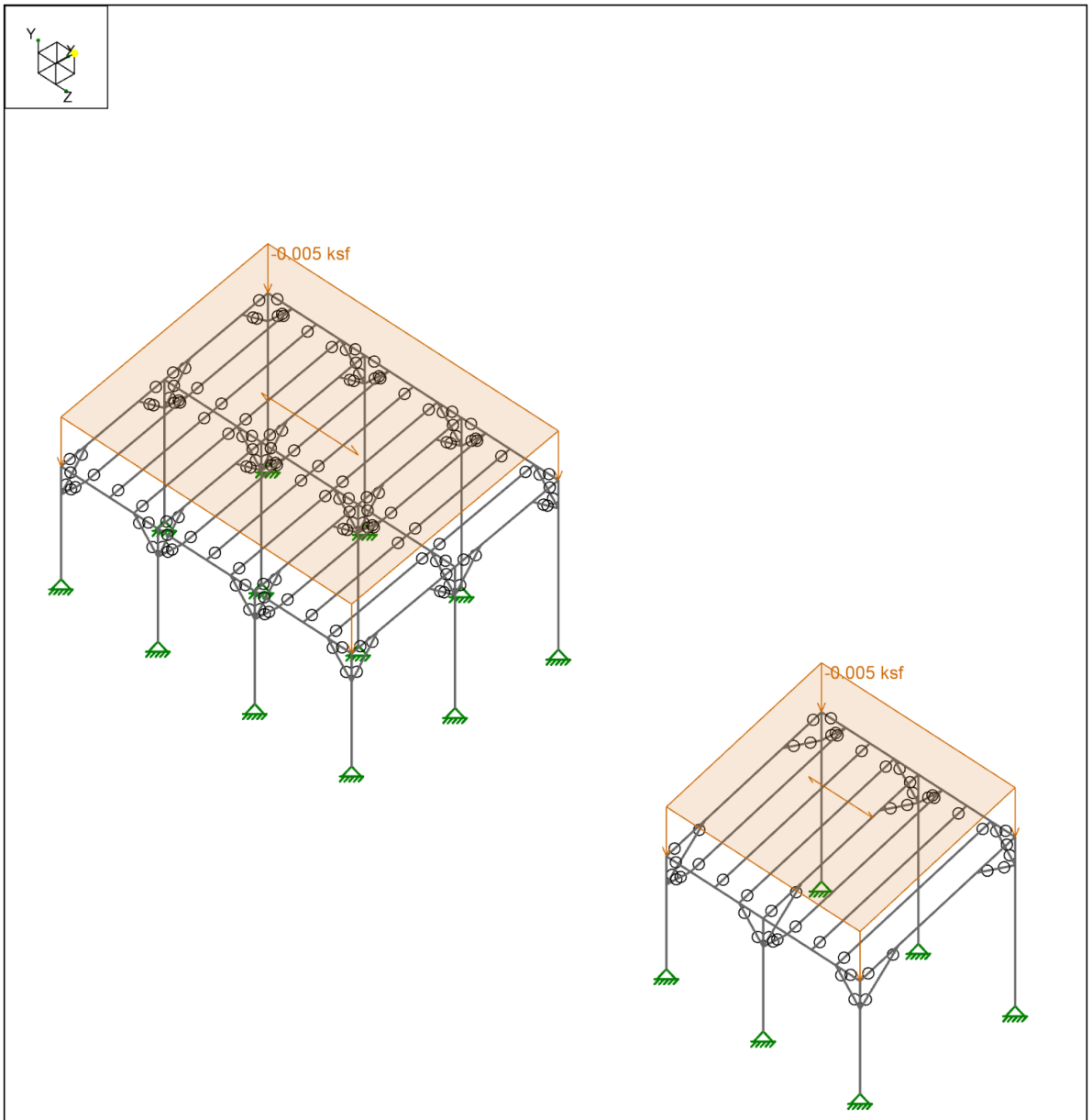
Sheet
Job No. 23066
By MLL
Date 1/12/24

Berkeley 2nd St Stair Pathways

DESIGN LOADS

Roof

		Decking	Joists	Beams	Seismic	
7/8" Corrugated Metal Roofing		1.5	1.5	1.5	1.5	
2x4 Wood Purlin @ 24" oc		0.0	0.7	0.7	0.7	
2x6 @ 24" oc		0.0	1.2	1.2	1.2	
Beams and Columns		0.0	0.0	1.0	1.0	
Mech/Elec/Miscellaneous		0.6	0.6	0.6	0.6	
	Dead Load	2.1	4.0	5.0	5.0	psf
	Live Load	20.0	20.0	20.0	0.0	psf
	Total Load	**22.1**	**24.0**	**25.0**	**5.0**	psf



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IDA Structural Engineers			SK-3
MLL			Jan 12, 2024 at 03:56 PM
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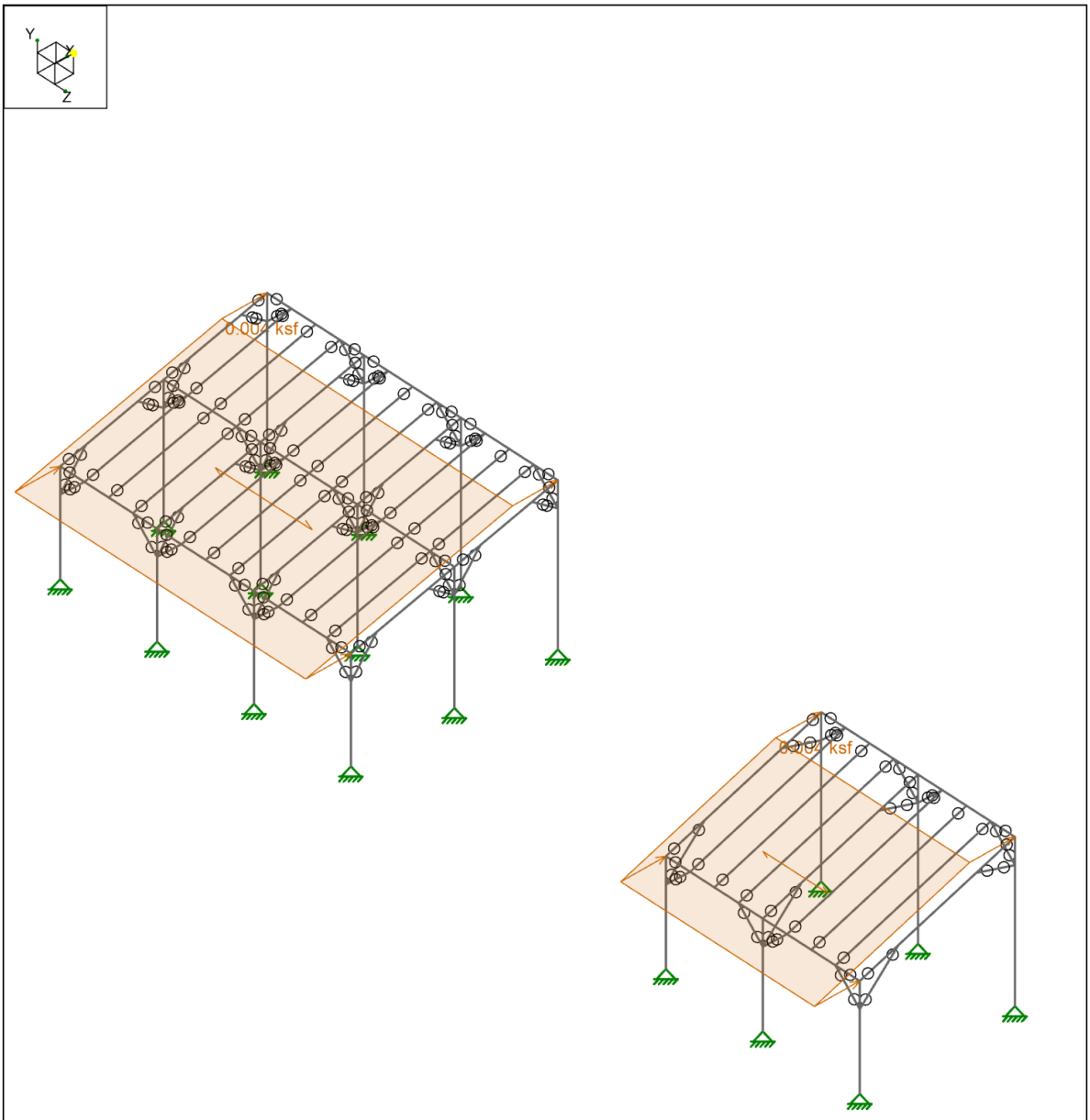

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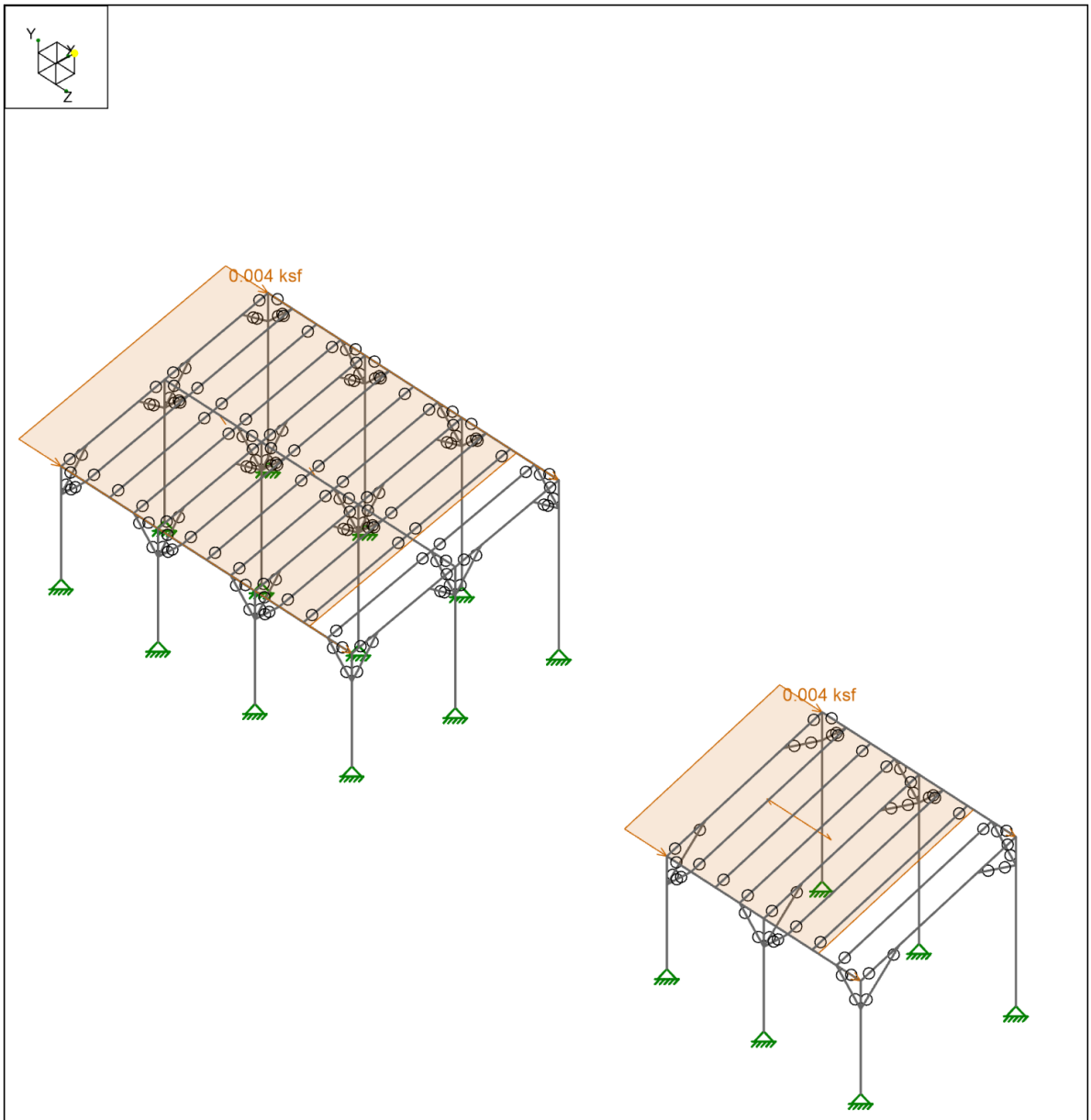

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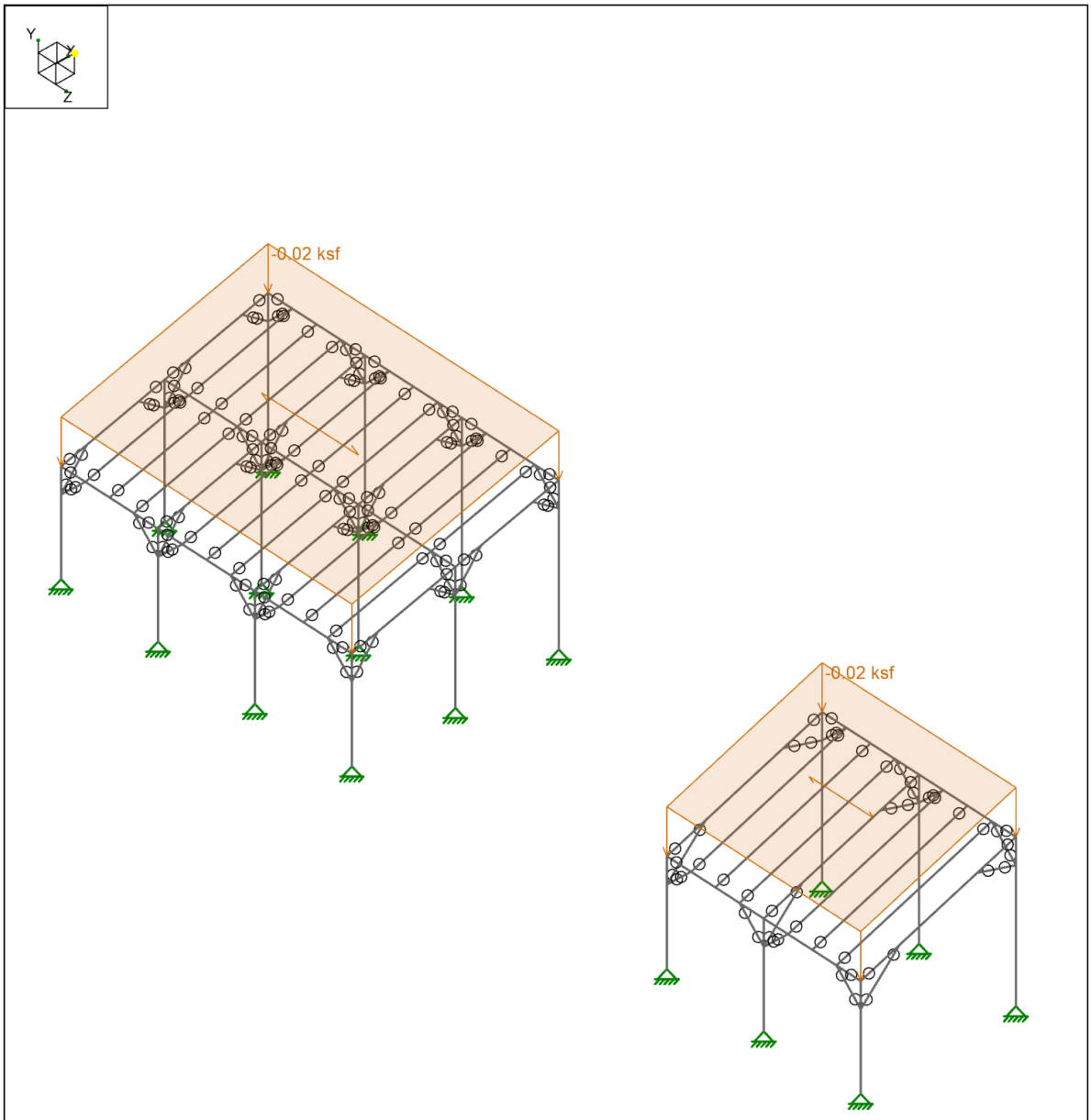

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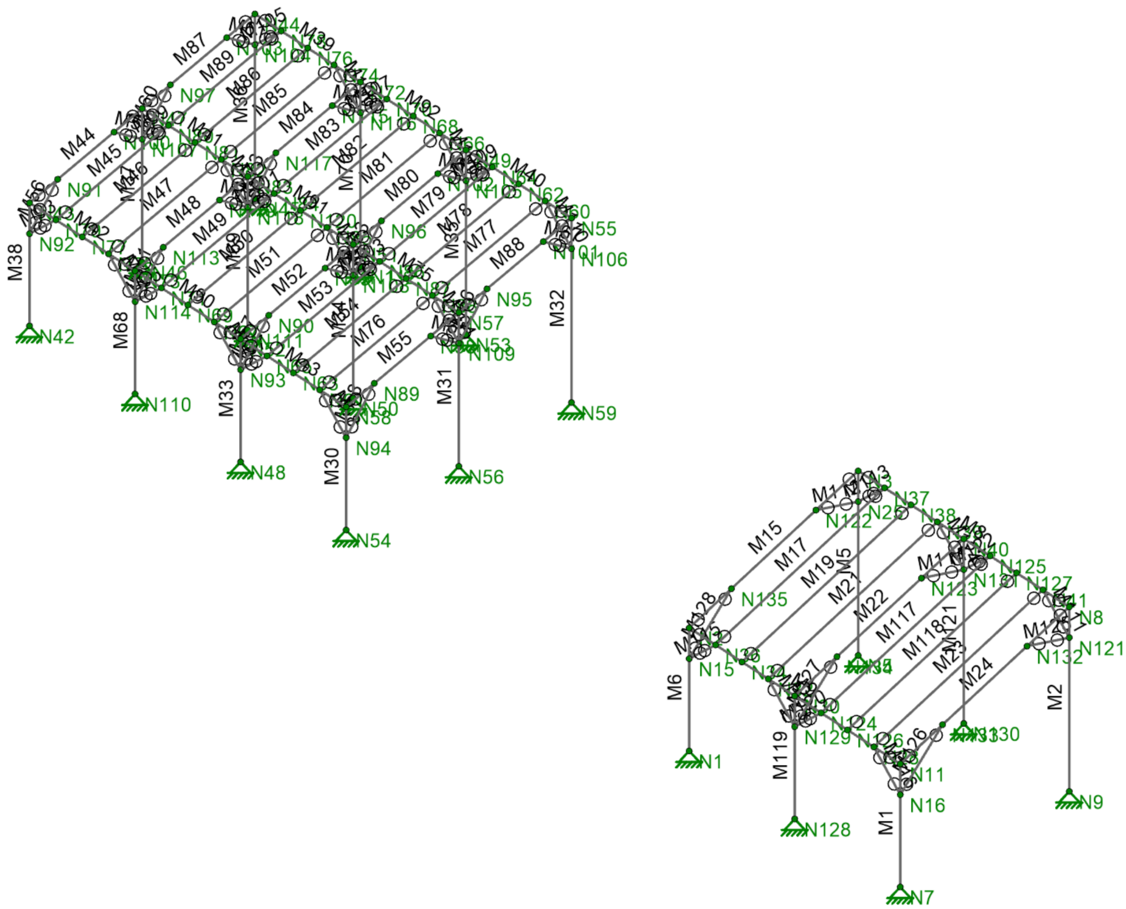

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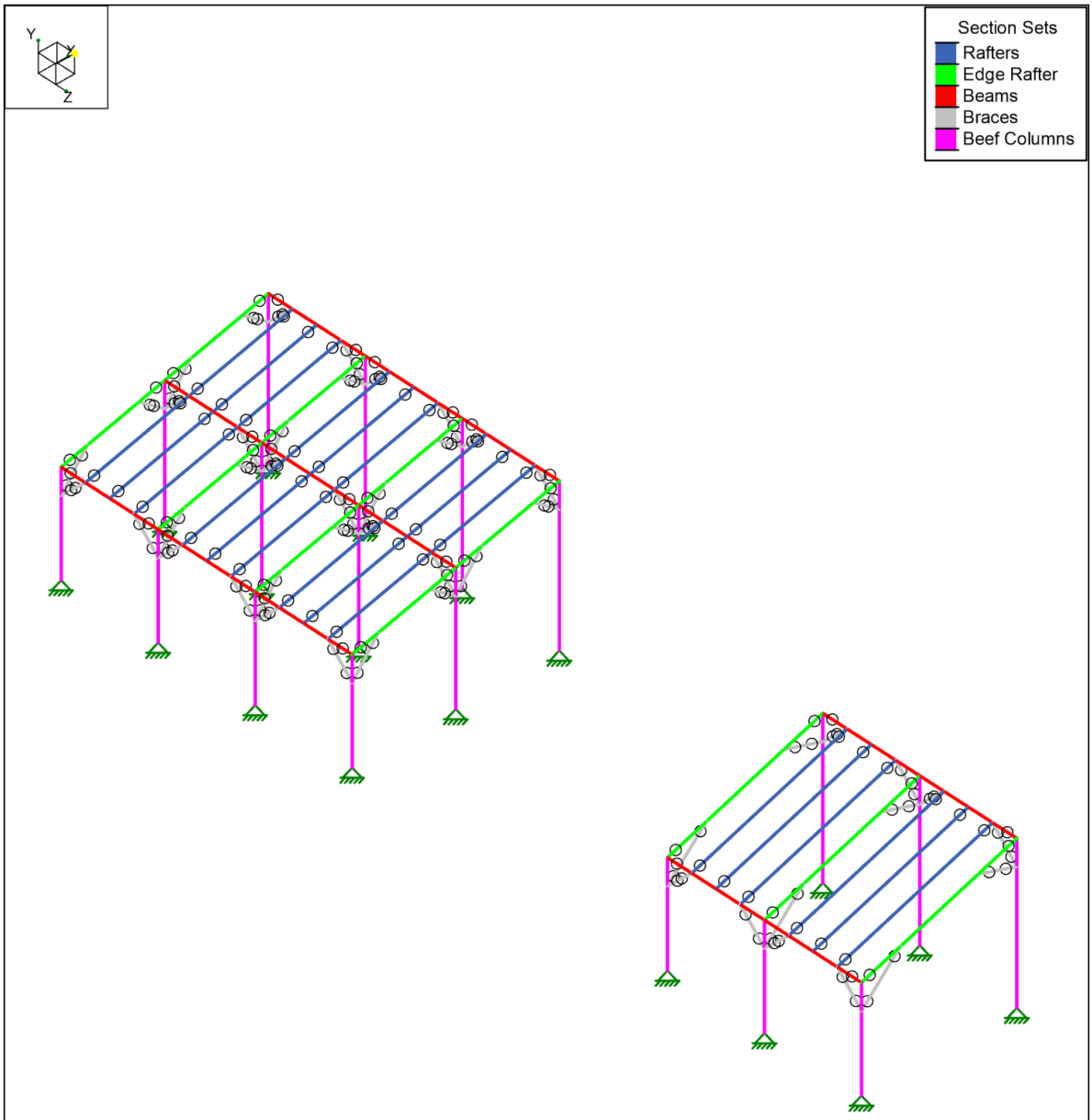

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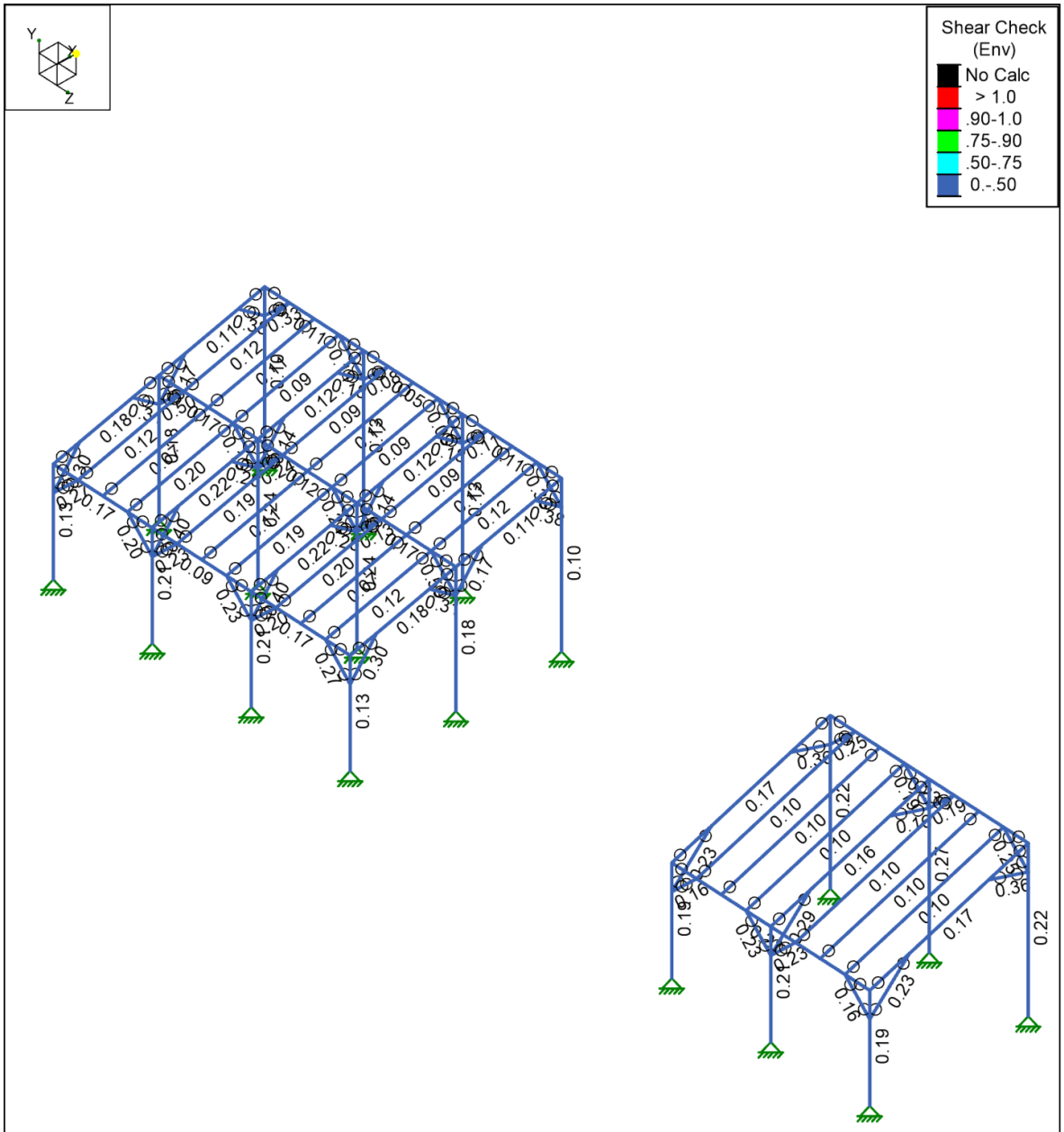
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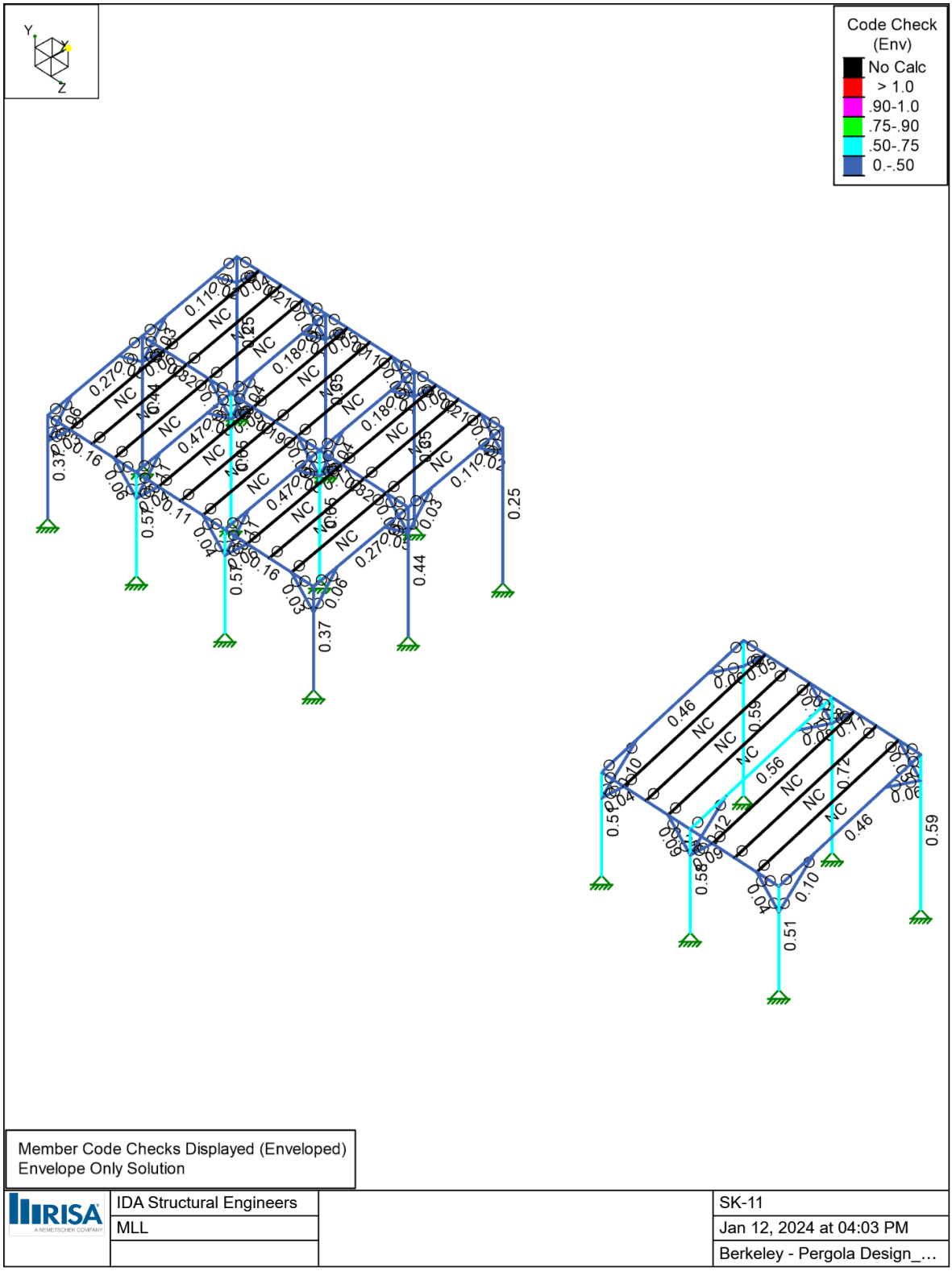
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IDA Structural Engineers
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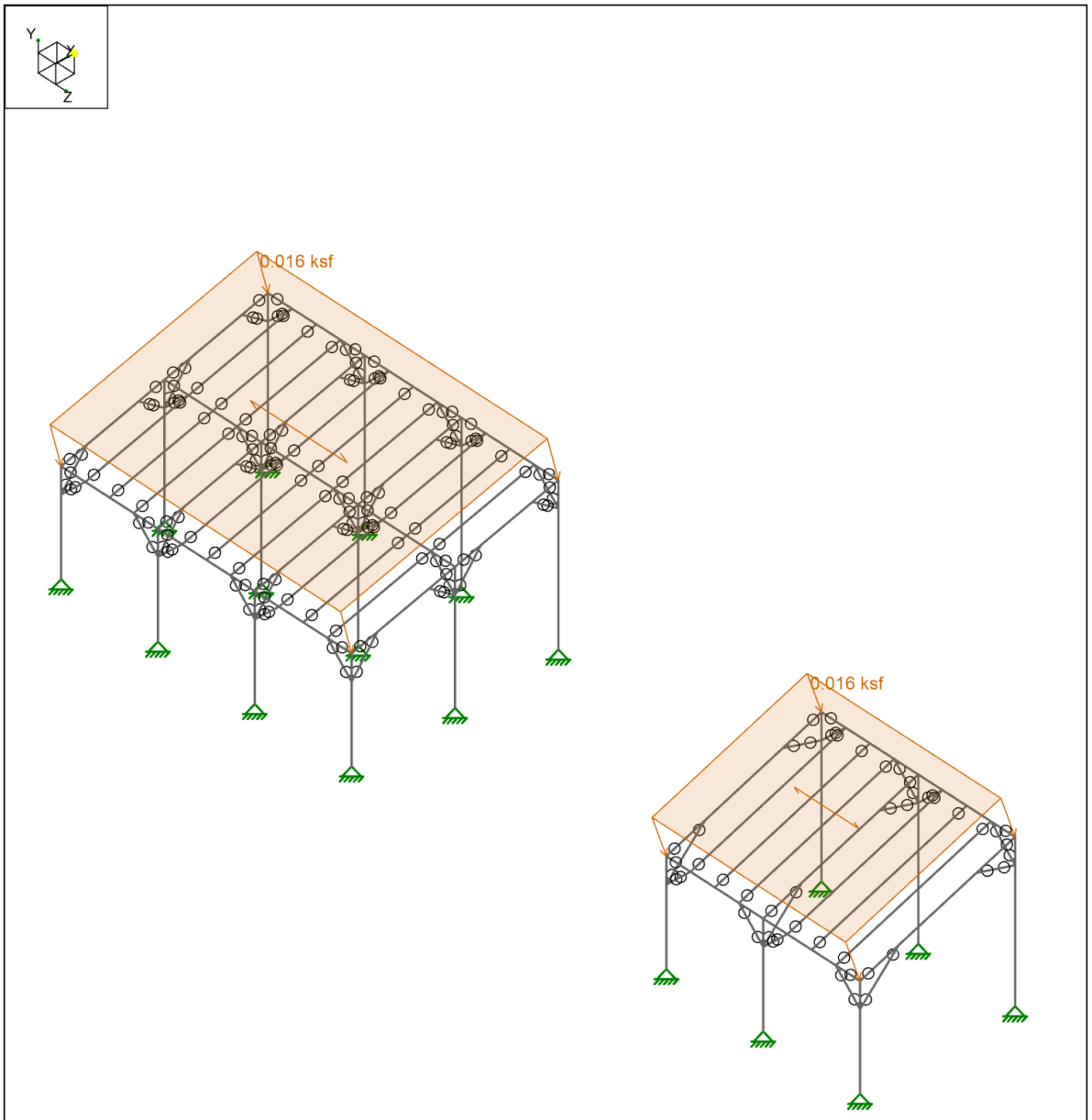

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IDA Structural Engineers			SK-7
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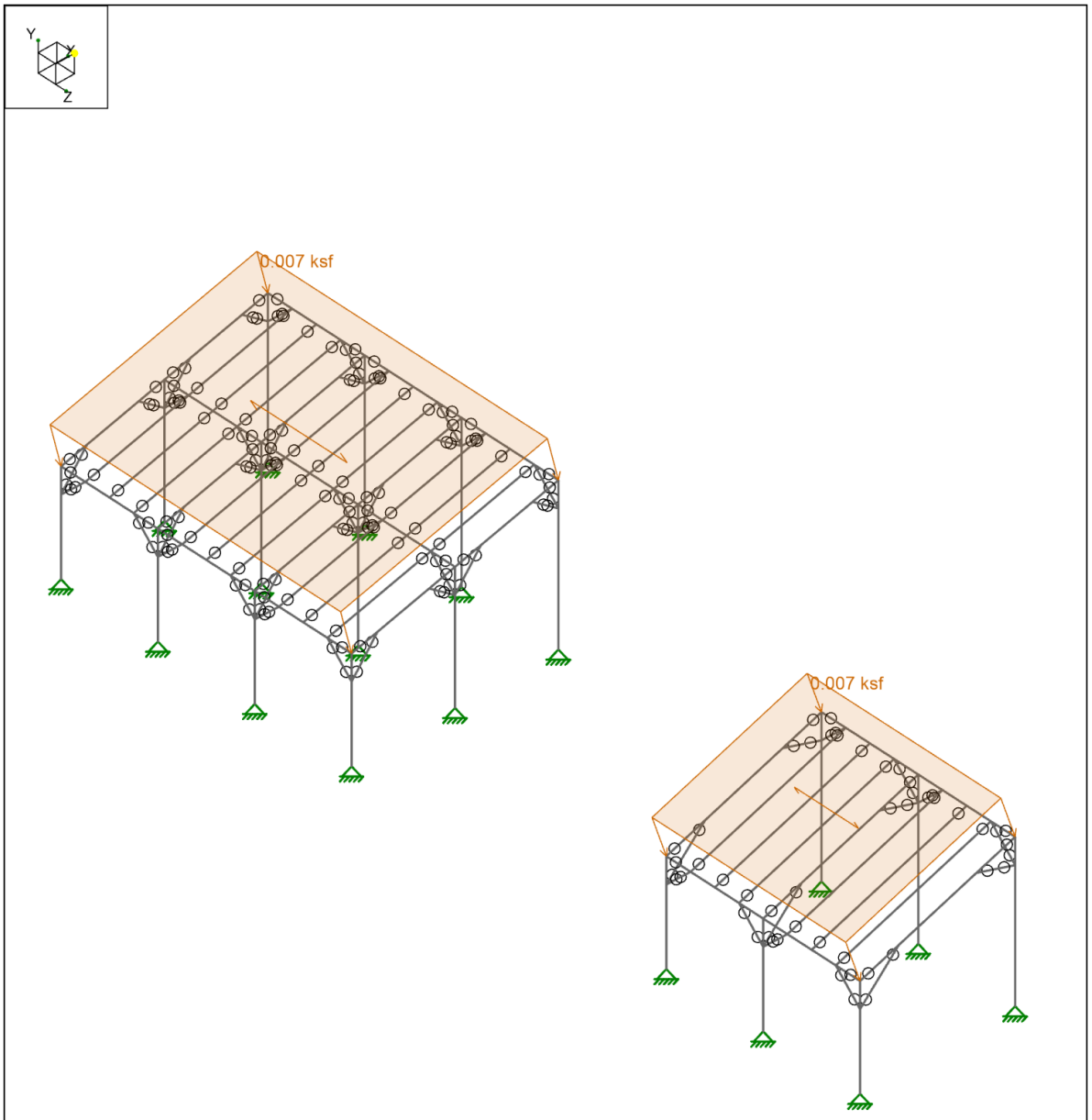


Loads: BLC 6, Wz
Envelope Only Solution

IDA Structural Engineers			SK-8
MLL			Jan 12, 2024 at 03:57 PM
			Berkeley - Pergola Design_v…

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	0	0	50	
2	N2	0	8	50	
3	N3	12	12	50	
4	N5	12	0	50	
5	N7	0	0	66	
6	N8	12	12	66	
7	N9	12	0	66	
8	N11	0	8	66	
9	N15	0	6	50	
10	N16	0	6	66	
11	N25	12	10	50	
12	N28	0	8	64	
13	N30	0	8	58	
14	N32	0	8	56	
15	N34	0	8	54	
16	N36	0	8	52	
17	N37	12	12	52	
18	N38	12	12	54	
19	N39	12	12	56	
20	N40	12	12	58	
21	N41	12	12	64	
22	N42	0	0	0	
23	N43	0	8	0	
24	N44	16	12	0	
25	N45	16	0	0	
26	N46	8	0	0	
27	N47	8	10	0	
28	N48	0	0	16	
29	N49	16	12	16	
30	N50	8	0	16	
31	N51	8	10	16	
32	N52	0	8	16	
33	N53	16	0	16	
34	N54	0	0	24	
35	N55	16	12	24	
36	N56	8	0	24	
37	N57	8	10	24	
38	N58	0	8	24	
39	N59	16	0	24	
40	N60	16	12	22	
41	N61	0	8	22	
42	N62	16	12	20	
43	N63	0	8	20	
44	N64	16	12	18	
45	N65	0	8	18	
46	N66	16	12	14	
47	N67	0	8	14	
48	N68	16	12	12	
49	N69	0	8	12	
50	N70	16	12	10	
51	N71	0	8	10	
52	N72	16	12	8	
53	N73	0	8	8	
54	N74	16	12	6	
55	N75	0	8	6	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
56	N76	16	12	4	
57	N77	0	8	4	
58	N78	16	12	2	
59	N79	0	8	2	
60	N80	8	10	2	
61	N81	8	10	4	
62	N82	8	10	6	
63	N83	8	10	8	
64	N84	8	10	10	
65	N85	8	10	14	
66	N86	8	10	18	
67	N87	8	10	20	
68	N88	8	10	22	
69	N89	2	8.5	24	
70	N90	2	8.5	16	
71	N91	2	8.5	0	
72	N92	0	6	0	
73	N93	0	6	16	
74	N94	0	6	24	
75	N95	10	10.5	24	
76	N96	10	10.5	16	
77	N97	10	10.5	0	
78	N98	6	9.5	24	
79	N99	6	9.5	16	
80	N100	6	9.5	0	
81	N101	14	11.5	24	
82	N102	14	11.5	16	
83	N103	14	11.5	0	
84	N104	16	10	0	
85	N105	16	10	16	
86	N106	16	10	24	
87	N107	8	8	0	
88	N108	8	8	16	
89	N109	8	8	24	
90	N110	0	0	8	
91	N111	8	0	8	
92	N112	16	0	8	
93	N113	2	8.5	8	
94	N114	0	6	8	
95	N115	14	11.5	8	
96	N116	16	10	8	
97	N117	10	10.5	8	
98	N118	8	8	8	
99	N119	6	9.5	8	
100	N120	8	10	12	
101	N121	12	10	66	
102	N124	0	8	60	
103	N125	12	12	60	
104	N126	0	8	62	
105	N127	12	12	62	
106	N128	0	0	58	
107	N129	0	6	58	
108	N130	12	0	58	
109	N131	12	10	58	
110	N122	9	11	50	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
111	N123	9	11	58	
112	N132	9	11	66	
113	N133	3	9	66	
114	N134	3	9	58	
115	N135	3	9	50	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]
1	N1	Reaction	Reaction	Reaction
2	N5	Reaction	Reaction	Reaction
3	N7	Reaction	Reaction	Reaction
4	N9	Reaction	Reaction	Reaction
5	N42	Reaction	Reaction	Reaction
6	N45	Reaction	Reaction	Reaction
7	N46	Reaction	Reaction	Reaction
8	N48	Reaction	Reaction	Reaction
9	N50	Reaction	Reaction	Reaction
10	N53	Reaction	Reaction	Reaction
11	N54	Reaction	Reaction	Reaction
12	N56	Reaction	Reaction	Reaction
13	N59	Reaction	Reaction	Reaction
14	N110	Reaction	Reaction	Reaction
15	N111	Reaction	Reaction	Reaction
16	N112	Reaction	Reaction	Reaction
17	N128	Reaction	Reaction	Reaction
18	N130	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N7	N11		Beef Columns	VBrace	Rectangular	DF	Typical
2	M2	N9	N8		Beef Columns	VBrace	Rectangular	DF	Typical
3	M5	N5	N3		Beef Columns	VBrace	Rectangular	DF	Typical
4	M6	N1	N2		Beef Columns	VBrace	Rectangular	DF	Typical
5	M8	N3	N8	90	Beams	Beam	Rectangular	DF	Typical
6	M9	N2	N11	90	Beams	Beam	Rectangular	DF	Typical
7	M15	N2	N3		Edge Rafter	Beam	Rectangular	DF	Typical
8	M17	N36	N37		Rafters	Beam	Rectangular	DF	Typical
9	M19	N34	N38		Rafters	Beam	Rectangular	DF	Typical
10	M21	N32	N39		Rafters	Beam	Rectangular	DF	Typical
11	M22	N30	N40		Edge Rafter	Beam	Rectangular	DF	Typical
12	M23	N28	N41		Rafters	Beam	Rectangular	DF	Typical
13	M24	N11	N8		Edge Rafter	Beam	Rectangular	DF	Typical
14	M30	N54	N58		Beef Columns	VBrace	Rectangular	DF	Typical
15	M31	N56	N57		Beef Columns	VBrace	Rectangular	DF	Typical
16	M32	N59	N55		Beef Columns	VBrace	Rectangular	DF	Typical
17	M33	N48	N52		Beef Columns	VBrace	Rectangular	DF	Typical
18	M34	N50	N51		Beef Columns	VBrace	Rectangular	DF	Typical
19	M35	N53	N49		Beef Columns	VBrace	Rectangular	DF	Typical
20	M36	N45	N44		Beef Columns	VBrace	Rectangular	DF	Typical
21	M37	N46	N47		Beef Columns	VBrace	Rectangular	DF	Typical
22	M38	N42	N43		Beef Columns	VBrace	Rectangular	DF	Typical
23	M39	N44	N72	90	Beams	Beam	Rectangular	DF	Typical
24	M40	N49	N55	90	Beams	Beam	Rectangular	DF	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
25	M41	N47	N83	90	Beams	Beam	Rectangular	DF	Typical
26	M42	N43	N73	90	Beams	Beam	Rectangular	DF	Typical
27	M43	N52	N58	90	Beams	Beam	Rectangular	DF	Typical
28	M44	N43	N47		Edge Rafter	Beam	Rectangular	DF	Typical
29	M45	N79	N80		Rafters	Beam	Rectangular	DF	Typical
30	M46	N77	N81		Rafters	Beam	Rectangular	DF	Typical
31	M47	N75	N82		Rafters	Beam	Rectangular	DF	Typical
32	M48	N73	N83		Edge Rafter	Beam	Rectangular	DF	Typical
33	M49	N71	N84		Rafters	Beam	Rectangular	DF	Typical
34	M50	N69	N120		Rafters	Beam	Rectangular	DF	Typical
35	M51	N67	N85		Rafters	Beam	Rectangular	DF	Typical
36	M52	N52	N51		Edge Rafter	Beam	Rectangular	DF	Typical
37	M53	N65	N86		Rafters	Beam	Rectangular	DF	Typical
38	M54	N63	N87		Rafters	Beam	Rectangular	DF	Typical
39	M55	N58	N57		Edge Rafter	Beam	Rectangular	DF	Typical
40	M56	N91	N92		Braces	VBrace	Rectangular	DF	Typical
41	M57	N90	N93		Braces	VBrace	Rectangular	DF	Typical
42	M58	N89	N94		Braces	VBrace	Rectangular	DF	Typical
43	M59	N100	N107		Braces	VBrace	Rectangular	DF	Typical
44	M60	N97	N107		Braces	VBrace	Rectangular	DF	Typical
45	M61	N103	N104		Braces	VBrace	Rectangular	DF	Typical
46	M62	N102	N105		Braces	VBrace	Rectangular	DF	Typical
47	M63	N96	N108		Braces	VBrace	Rectangular	DF	Typical
48	M64	N99	N108		Braces	VBrace	Rectangular	DF	Typical
49	M65	N98	N109		Braces	VBrace	Rectangular	DF	Typical
50	M66	N95	N109		Braces	VBrace	Rectangular	DF	Typical
51	M67	N101	N106		Braces	VBrace	Rectangular	DF	Typical
52	M68	N110	N73		Beef Columns	VBrace	Rectangular	DF	Typical
53	M69	N111	N83		Beef Columns	VBrace	Rectangular	DF	Typical
54	M70	N112	N72		Beef Columns	VBrace	Rectangular	DF	Typical
55	M71	N113	N114		Braces	VBrace	Rectangular	DF	Typical
56	M72	N115	N116		Braces	VBrace	Rectangular	DF	Typical
57	M73	N117	N118		Braces	VBrace	Rectangular	DF	Typical
58	M74	N119	N118		Braces	VBrace	Rectangular	DF	Typical
59	M75	N51	N57	90	Beams	Beam	Rectangular	DF	Typical
60	M76	N61	N88		Rafters	Beam	Rectangular	DF	Typical
61	M77	N88	N60		Rafters	Beam	Rectangular	DF	Typical
62	M78	N87	N62		Rafters	Beam	Rectangular	DF	Typical
63	M79	N86	N64		Rafters	Beam	Rectangular	DF	Typical
64	M80	N51	N49		Edge Rafter	Beam	Rectangular	DF	Typical
65	M81	N85	N66		Rafters	Beam	Rectangular	DF	Typical
66	M82	N120	N68		Rafters	Beam	Rectangular	DF	Typical
67	M83	N84	N70		Rafters	Beam	Rectangular	DF	Typical
68	M84	N83	N72		Edge Rafter	Beam	Rectangular	DF	Typical
69	M85	N82	N74		Rafters	Beam	Rectangular	DF	Typical
70	M86	N81	N76		Rafters	Beam	Rectangular	DF	Typical
71	M87	N47	N44		Edge Rafter	Beam	Rectangular	DF	Typical
72	M88	N57	N55		Edge Rafter	Beam	Rectangular	DF	Typical
73	M89	N80	N78		Rafters	Beam	Rectangular	DF	Typical
74	M90	N73	N52	90	Beams	Beam	Rectangular	DF	Typical
75	M91	N83	N51	90	Beams	Beam	Rectangular	DF	Typical
76	M92	N72	N49	90	Beams	Beam	Rectangular	DF	Typical
77	M93	N92	N79		Braces	VBrace	Rectangular	DF	Typical
78	M94	N114	N75		Braces	VBrace	Rectangular	DF	Typical
79	M95	N114	N71		Braces	VBrace	Rectangular	DF	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
80	M96	N93	N67		Braces	VBrace	Rectangular	DF	Typical
81	M97	N93	N65		Braces	VBrace	Rectangular	DF	Typical
82	M98	N94	N61		Braces	VBrace	Rectangular	DF	Typical
83	M99	N107	N80		Braces	VBrace	Rectangular	DF	Typical
84	M100	N118	N82		Braces	VBrace	Rectangular	DF	Typical
85	M101	N118	N84		Braces	VBrace	Rectangular	DF	Typical
86	M102	N108	N85		Braces	VBrace	Rectangular	DF	Typical
87	M103	N108	N86		Braces	VBrace	Rectangular	DF	Typical
88	M104	N109	N88		Braces	VBrace	Rectangular	DF	Typical
89	M105	N104	N78		Braces	VBrace	Rectangular	DF	Typical
90	M106	N116	N74		Braces	VBrace	Rectangular	DF	Typical
91	M107	N116	N70		Braces	VBrace	Rectangular	DF	Typical
92	M108	N105	N66		Braces	VBrace	Rectangular	DF	Typical
93	M109	N105	N64		Braces	VBrace	Rectangular	DF	Typical
94	M110	N106	N60		Braces	VBrace	Rectangular	DF	Typical
95	M113	N25	N37		Braces	VBrace	Rectangular	DF	Typical
96	M115	N15	N36		Braces	VBrace	Rectangular	DF	Typical
97	M116	N16	N28		Braces	VBrace	Rectangular	DF	Typical
98	M111	N121	N41		Braces	VBrace	Rectangular	DF	Typical
99	M117	N124	N125		Rafters	Beam	Rectangular	DF	Typical
100	M118	N126	N127		Rafters	Beam	Rectangular	DF	Typical
101	M119	N128	N30		Beef Columns	VBrace	Rectangular	DF	Typical
102	M120	N129	N124		Braces	VBrace	Rectangular	DF	Typical
103	M121	N130	N40		Beef Columns	VBrace	Rectangular	DF	Typical
104	M122	N131	N125		Braces	VBrace	Rectangular	DF	Typical
105	M123	N129	N32		Braces	VBrace	Rectangular	DF	Typical
106	M124	N131	N39		Braces	VBrace	Rectangular	DF	Typical
107	M112	N25	N122		Braces	VBrace	Rectangular	DF	Typical
108	M114	N131	N123		Braces	VBrace	Rectangular	DF	Typical
109	M125	N121	N132		Braces	VBrace	Rectangular	DF	Typical
110	M126	N16	N133		Braces	VBrace	Rectangular	DF	Typical
111	M127	N129	N134		Braces	VBrace	Rectangular	DF	Typical
112	M128	N15	N135		Braces	VBrace	Rectangular	DF	Typical

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Plate Methodology
1	gen_Conc3NW	3155	1372	0.15	0.6	0.145	Isotropic
2	gen_Conc4NW	3644	1584	0.15	0.6	0.145	Isotropic
3	gen_Conc3LW	2085	906	0.15	0.6	0.11	Isotropic
4	gen_Conc4LW	2408	1047	0.15	0.6	0.11	Isotropic
5	gen_Alum	10100	4077	0.3	1.29	0.173	Isotropic
6	gen_Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	RIGID	1e+6		0.3	0	0	Isotropic

General Section Sets

	Label	Shape	Type	Material	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
1	Column	P5501	Column	gen_Steel	1.452	0.669	2.805	0.005
2	Joist	P1000	Beam	gen_Steel	0.555	0.236	0.185	0.002
3	Beam	P1001	Beam	gen_Steel	1.111	0.471	0.928	0.004
4	VBrace	P1000	VBrace	gen_Steel	0.555	0.236	0.185	0.002
5	HBrace	P1000	HBrace	gen_Steel	0.555	0.236	0.185	0.002
6	Support Col	P1000	Column	gen_Steel	0.555	0.236	0.185	0.002
7	Support Brace	P5001	VBrace	gen_Steel	1.793	0.866	6.227	0.001

Hot Rolled Steel Design Parameters

No Data to Print...

Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M44	Y	-0.005	-0.005	9.992e-16	8.246
2	M45	Y	-0.01	-0.01	1.443e-15	8.246
3	M46	Y	-0.01	-0.01	9.992e-16	8.246
4	M47	Y	-0.01	-0.01	1.443e-15	8.246
5	M48	Y	-0.01	-0.01	5.551e-16	8.246
6	M49	Y	-0.01	-0.01	9.992e-16	8.246
7	M50	Y	-0.01	-0.01	1.443e-15	8.246
8	M51	Y	-0.01	-0.01	9.992e-16	8.246
9	M52	Y	-0.01	-0.01	9.992e-16	8.246
10	M53	Y	-0.01	-0.01	1.221e-15	8.246
11	M54	Y	-0.01	-0.01	1.11e-16	8.246
12	M55	Y	-0.005	-0.005	2.776e-15	8.246
13	M76	Y	-0.01	-0.01	1.11e-16	8.246
14	M77	Y	-0.01	-0.01	1.554e-15	8.246
15	M78	Y	-0.01	-0.01	0	8.246
16	M79	Y	-0.01	-0.01	5.551e-16	8.246
17	M80	Y	-0.01	-0.01	4.996e-15	8.246
18	M81	Y	-0.01	-0.01	3.331e-15	8.246
19	M82	Y	-0.01	-0.01	0	8.246
20	M83	Y	-0.01	-0.01	0	8.246
21	M84	Y	-0.01	-0.01	0	8.246
22	M85	Y	-0.01	-0.01	1.998e-15	8.246
23	M86	Y	-0.01	-0.01	0	8.246
24	M87	Y	-0.005	-0.005	0	8.246
25	M88	Y	-0.005	-0.005	0	8.246
26	M89	Y	-0.01	-0.01	0	8.246
27	M15	Y	-0.005	-0.005	0	12.649
28	M17	Y	-0.01	-0.01	4.33e-15	12.649
29	M19	Y	-0.01	-0.01	9.326e-15	12.649
30	M21	Y	-0.01	-0.01	5.662e-15	12.649
31	M22	Y	-0.01	-0.01	3.886e-15	12.649
32	M23	Y	-0.01	-0.01	6.661e-15	12.649
33	M24	Y	-0.005	-0.005	9.437e-15	12.649
34	M117	Y	-0.01	-0.01	0	12.649
35	M118	Y	-0.01	-0.01	9.326e-15	12.649

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M44	Y	-0.02	-0.02	9.992e-16	8.246
2	M45	Y	-0.04	-0.04	1.443e-15	8.246
3	M46	Y	-0.04	-0.04	9.992e-16	8.246
4	M47	Y	-0.04	-0.04	1.443e-15	8.246
5	M48	Y	-0.04	-0.04	5.551e-16	8.246
6	M49	Y	-0.04	-0.04	9.992e-16	8.246
7	M50	Y	-0.04	-0.04	1.443e-15	8.246
8	M51	Y	-0.04	-0.04	9.992e-16	8.246
9	M52	Y	-0.04	-0.04	9.992e-16	8.246
10	M53	Y	-0.04	-0.04	1.221e-15	8.246
11	M54	Y	-0.04	-0.04	1.11e-16	8.246
12	M55	Y	-0.02	-0.02	2.776e-15	8.246

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
13	M76	Y	-0.04	-0.04	1.11e-16	8.246
14	M77	Y	-0.04	-0.04	1.554e-15	8.246
15	M78	Y	-0.04	-0.04	0	8.246
16	M79	Y	-0.04	-0.04	5.551e-16	8.246
17	M80	Y	-0.04	-0.04	4.996e-15	8.246
18	M81	Y	-0.04	-0.04	3.331e-15	8.246
19	M82	Y	-0.04	-0.04	0	8.246
20	M83	Y	-0.04	-0.04	0	8.246
21	M84	Y	-0.04	-0.04	0	8.246
22	M85	Y	-0.04	-0.04	1.998e-15	8.246
23	M86	Y	-0.04	-0.04	0	8.246
24	M87	Y	-0.02	-0.02	0	8.246
25	M88	Y	-0.02	-0.02	0	8.246
26	M89	Y	-0.04	-0.04	0	8.246
27	M15	Y	-0.02	-0.02	0	12.649
28	M17	Y	-0.04	-0.04	4.33e-15	12.649
29	M19	Y	-0.04	-0.04	9.326e-15	12.649
30	M21	Y	-0.04	-0.04	5.662e-15	12.649
31	M22	Y	-0.04	-0.04	3.886e-15	12.649
32	M23	Y	-0.04	-0.04	6.661e-15	12.649
33	M24	Y	-0.02	-0.02	9.437e-15	12.649
34	M117	Y	-0.04	-0.04	0	12.649
35	M118	Y	-0.04	-0.04	9.326e-15	12.649

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M44	X	0.004	0.004	9.992e-16	8.246
2	M45	X	0.007	0.007	1.443e-15	8.246
3	M46	X	0.007	0.007	9.992e-16	8.246
4	M47	X	0.007	0.007	1.443e-15	8.246
5	M48	X	0.007	0.007	5.551e-16	8.246
6	M49	X	0.007	0.007	9.992e-16	8.246
7	M50	X	0.007	0.007	1.443e-15	8.246
8	M51	X	0.007	0.007	9.992e-16	8.246
9	M52	X	0.007	0.007	9.992e-16	8.246
10	M53	X	0.007	0.007	1.221e-15	8.246
11	M54	X	0.007	0.007	1.11e-16	8.246
12	M55	X	0.004	0.004	2.776e-15	8.246
13	M76	X	0.007	0.007	1.11e-16	8.246
14	M77	X	0.007	0.007	1.554e-15	8.246
15	M78	X	0.007	0.007	0	8.246
16	M79	X	0.007	0.007	5.551e-16	8.246
17	M80	X	0.007	0.007	4.996e-15	8.246
18	M81	X	0.007	0.007	3.331e-15	8.246
19	M82	X	0.007	0.007	0	8.246
20	M83	X	0.007	0.007	0	8.246
21	M84	X	0.007	0.007	0	8.246
22	M85	X	0.007	0.007	1.998e-15	8.246
23	M86	X	0.007	0.007	0	8.246
24	M87	X	0.004	0.004	0	8.246
25	M88	X	0.004	0.004	0	8.246
26	M89	X	0.007	0.007	0	8.246
27	M15	X	0.004	0.004	0	12.649
28	M17	X	0.007	0.007	4.33e-15	12.649
29	M19	X	0.007	0.007	9.326e-15	12.649

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
30	M21	X	0.007	0.007	5.662e-15	12.649
31	M22	X	0.007	0.007	3.886e-15	12.649
32	M23	X	0.007	0.007	6.661e-15	12.649
33	M24	X	0.004	0.004	9.437e-15	12.649
34	M117	X	0.007	0.007	0	12.649
35	M118	X	0.007	0.007	9.326e-15	12.649

Member Distributed Loads (BLC 10 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M24	Z	0.004	0.004	9.437e-15	12.649
2	M117	Z	0.007	0.007	0	12.649
3	M118	Z	0.007	0.007	9.326e-15	12.649
4	M44	Z	0.004	0.004	9.992e-16	8.246
5	M45	Z	0.007	0.007	1.443e-15	8.246
6	M46	Z	0.007	0.007	9.992e-16	8.246
7	M47	Z	0.007	0.007	1.443e-15	8.246
8	M48	Z	0.007	0.007	5.551e-16	8.246
9	M49	Z	0.007	0.007	9.992e-16	8.246
10	M50	Z	0.007	0.007	1.443e-15	8.246
11	M51	Z	0.007	0.007	9.992e-16	8.246
12	M52	Z	0.007	0.007	9.992e-16	8.246
13	M53	Z	0.007	0.007	1.221e-15	8.246
14	M54	Z	0.007	0.007	1.11e-16	8.246
15	M55	Z	0.004	0.004	2.776e-15	8.246
16	M76	Z	0.007	0.007	1.11e-16	8.246
17	M77	Z	0.007	0.007	1.554e-15	8.246
18	M78	Z	0.007	0.007	0	8.246
19	M79	Z	0.007	0.007	5.551e-16	8.246
20	M80	Z	0.007	0.007	4.996e-15	8.246
21	M81	Z	0.007	0.007	3.331e-15	8.246
22	M82	Z	0.007	0.007	0	8.246
23	M83	Z	0.007	0.007	0	8.246
24	M84	Z	0.007	0.007	0	8.246
25	M85	Z	0.007	0.007	1.998e-15	8.246
26	M86	Z	0.007	0.007	0	8.246
27	M87	Z	0.004	0.004	0	8.246
28	M88	Z	0.004	0.004	0	8.246
29	M89	Z	0.007	0.007	0	8.246
30	M15	Z	0.004	0.004	0	12.649
31	M17	Z	0.007	0.007	4.33e-15	12.649
32	M19	Z	0.007	0.007	9.326e-15	12.649
33	M21	Z	0.007	0.007	5.662e-15	12.649
34	M22	Z	0.007	0.007	3.886e-15	12.649
35	M23	Z	0.007	0.007	6.661e-15	12.649

Member Distributed Loads (BLC 11 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M44	X	0.004	0.004	9.992e-16	8.246
2	M44	Y	-0.016	-0.016	9.992e-16	8.246
3	M45	X	0.008	0.008	1.443e-15	8.246
4	M45	Y	-0.031	-0.031	1.443e-15	8.246
5	M46	X	0.008	0.008	9.992e-16	8.246
6	M46	Y	-0.031	-0.031	9.992e-16	8.246

Member Distributed Loads (BLC 11 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
7	M47	X	0.008	0.008	1.443e-15	8.246
8	M47	Y	-0.031	-0.031	1.443e-15	8.246
9	M48	X	0.008	0.008	5.551e-16	8.246
10	M48	Y	-0.031	-0.031	5.551e-16	8.246
11	M49	X	0.008	0.008	9.992e-16	8.246
12	M49	Y	-0.031	-0.031	9.992e-16	8.246
13	M50	X	0.008	0.008	1.443e-15	8.246
14	M50	Y	-0.031	-0.031	1.443e-15	8.246
15	M51	X	0.008	0.008	9.992e-16	8.246
16	M51	Y	-0.031	-0.031	9.992e-16	8.246
17	M52	X	0.008	0.008	9.992e-16	8.246
18	M52	Y	-0.031	-0.031	9.992e-16	8.246
19	M53	X	0.008	0.008	1.221e-15	8.246
20	M53	Y	-0.031	-0.031	1.221e-15	8.246
21	M54	X	0.008	0.008	1.11e-16	8.246
22	M54	Y	-0.031	-0.031	1.11e-16	8.246
23	M55	X	0.004	0.004	2.776e-15	8.246
24	M55	Y	-0.016	-0.016	2.776e-15	8.246
25	M76	X	0.008	0.008	1.11e-16	8.246
26	M76	Y	-0.031	-0.031	1.11e-16	8.246
27	M77	X	0.008	0.008	1.554e-15	8.246
28	M77	Y	-0.031	-0.031	1.554e-15	8.246
29	M78	X	0.008	0.008	0	8.246
30	M78	Y	-0.031	-0.031	0	8.246
31	M79	X	0.008	0.008	5.551e-16	8.246
32	M79	Y	-0.031	-0.031	5.551e-16	8.246
33	M80	X	0.008	0.008	4.996e-15	8.246
34	M80	Y	-0.031	-0.031	4.996e-15	8.246
35	M81	X	0.008	0.008	3.331e-15	8.246
36	M81	Y	-0.031	-0.031	3.331e-15	8.246
37	M82	X	0.008	0.008	0	8.246
38	M82	Y	-0.031	-0.031	0	8.246
39	M83	X	0.008	0.008	0	8.246
40	M83	Y	-0.031	-0.031	0	8.246
41	M84	X	0.008	0.008	0	8.246
42	M84	Y	-0.031	-0.031	0	8.246
43	M85	X	0.008	0.008	1.998e-15	8.246
44	M85	Y	-0.031	-0.031	1.998e-15	8.246
45	M86	X	0.008	0.008	0	8.246
46	M86	Y	-0.031	-0.031	0	8.246
47	M87	X	0.004	0.004	0	8.246
48	M87	Y	-0.016	-0.016	0	8.246
49	M88	X	0.004	0.004	0	8.246
50	M88	Y	-0.016	-0.016	0	8.246
51	M89	X	0.008	0.008	0	8.246
52	M89	Y	-0.031	-0.031	0	8.246
53	M15	X	0.005	0.005	0	12.649
54	M15	Y	-0.015	-0.015	0	12.649
55	M17	X	0.01	0.01	4.33e-15	12.649
56	M17	Y	-0.03	-0.03	4.33e-15	12.649
57	M19	X	0.01	0.01	9.326e-15	12.649
58	M19	Y	-0.03	-0.03	9.326e-15	12.649
59	M21	X	0.01	0.01	5.662e-15	12.649
60	M21	Y	-0.03	-0.03	5.662e-15	12.649
61	M22	X	0.01	0.01	3.886e-15	12.649

Member Distributed Loads (BLC 11 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
62	M22	Y	-0.03	-0.03	3.886e-15	12.649
63	M23	X	0.01	0.01	6.661e-15	12.649
64	M23	Y	-0.03	-0.03	6.661e-15	12.649
65	M24	X	0.005	0.005	9.437e-15	12.649
66	M24	Y	-0.015	-0.015	9.437e-15	12.649
67	M117	X	0.01	0.01	0	12.649
68	M117	Y	-0.03	-0.03	0	12.649
69	M118	X	0.01	0.01	9.326e-15	12.649
70	M118	Y	-0.03	-0.03	9.326e-15	12.649

Member Distributed Loads (BLC 12 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M117	Y	-0.013	-0.013	0	12.649
2	M118	X	0.004	0.004	9.326e-15	12.649
3	M118	Y	-0.013	-0.013	9.326e-15	12.649
4	M44	X	0.002	0.002	9.992e-16	8.246
5	M44	Y	-0.007	-0.007	9.992e-16	8.246
6	M45	X	0.003	0.003	1.443e-15	8.246
7	M45	Y	-0.014	-0.014	1.443e-15	8.246
8	M46	X	0.003	0.003	9.992e-16	8.246
9	M46	Y	-0.014	-0.014	9.992e-16	8.246
10	M47	X	0.003	0.003	1.443e-15	8.246
11	M47	Y	-0.014	-0.014	1.443e-15	8.246
12	M48	X	0.003	0.003	5.551e-16	8.246
13	M48	Y	-0.014	-0.014	5.551e-16	8.246
14	M49	X	0.003	0.003	9.992e-16	8.246
15	M49	Y	-0.014	-0.014	9.992e-16	8.246
16	M50	X	0.003	0.003	1.443e-15	8.246
17	M50	Y	-0.014	-0.014	1.443e-15	8.246
18	M51	X	0.003	0.003	9.992e-16	8.246
19	M51	Y	-0.014	-0.014	9.992e-16	8.246
20	M52	X	0.003	0.003	9.992e-16	8.246
21	M52	Y	-0.014	-0.014	9.992e-16	8.246
22	M53	X	0.003	0.003	1.221e-15	8.246
23	M53	Y	-0.014	-0.014	1.221e-15	8.246
24	M54	X	0.003	0.003	1.11e-16	8.246
25	M54	Y	-0.014	-0.014	1.11e-16	8.246
26	M55	X	0.002	0.002	2.776e-15	8.246
27	M55	Y	-0.007	-0.007	2.776e-15	8.246
28	M76	X	0.003	0.003	1.11e-16	8.246
29	M76	Y	-0.014	-0.014	1.11e-16	8.246
30	M77	X	0.003	0.003	1.554e-15	8.246
31	M77	Y	-0.014	-0.014	1.554e-15	8.246
32	M78	X	0.003	0.003	0	8.246
33	M78	Y	-0.014	-0.014	0	8.246
34	M79	X	0.003	0.003	5.551e-16	8.246
35	M79	Y	-0.014	-0.014	5.551e-16	8.246
36	M80	X	0.003	0.003	4.996e-15	8.246
37	M80	Y	-0.014	-0.014	4.996e-15	8.246
38	M81	X	0.003	0.003	3.331e-15	8.246
39	M81	Y	-0.014	-0.014	3.331e-15	8.246
40	M82	X	0.003	0.003	0	8.246
41	M82	Y	-0.014	-0.014	0	8.246
42	M83	X	0.003	0.003	0	8.246
43	M83	Y	-0.014	-0.014	0	8.246

Member Distributed Loads (BLC 12 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
44	M84	X	0.003	0.003	0	8.246
45	M84	Y	-0.014	-0.014	0	8.246
46	M85	X	0.003	0.003	1.998e-15	8.246
47	M85	Y	-0.014	-0.014	1.998e-15	8.246
48	M86	X	0.003	0.003	0	8.246
49	M86	Y	-0.014	-0.014	0	8.246
50	M87	X	0.002	0.002	0	8.246
51	M87	Y	-0.007	-0.007	0	8.246
52	M88	X	0.002	0.002	0	8.246
53	M88	Y	-0.007	-0.007	0	8.246
54	M89	X	0.003	0.003	0	8.246
55	M89	Y	-0.014	-0.014	0	8.246
56	M15	X	0.002	0.002	0	12.649
57	M15	Y	-0.007	-0.007	0	12.649
58	M17	X	0.004	0.004	4.33e-15	12.649
59	M17	Y	-0.013	-0.013	4.33e-15	12.649
60	M19	X	0.004	0.004	9.326e-15	12.649
61	M19	Y	-0.013	-0.013	9.326e-15	12.649
62	M21	X	0.004	0.004	5.662e-15	12.649
63	M21	Y	-0.013	-0.013	5.662e-15	12.649
64	M22	X	0.004	0.004	3.886e-15	12.649
65	M22	Y	-0.013	-0.013	3.886e-15	12.649
66	M23	X	0.004	0.004	6.661e-15	12.649
67	M23	Y	-0.013	-0.013	6.661e-15	12.649
68	M24	X	0.002	0.002	9.437e-15	12.649
69	M24	Y	-0.007	-0.007	9.437e-15	12.649
70	M117	X	0.004	0.004	0	12.649

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	D	Yes	Y	1	1								
2	L	Yes	Y			2	1						
3	D + L	Yes	Y	1	1	2	1						
4	D + 0.75L	Yes	Y	1	1	2	0.75						
5			Y										
6	(1.0+0.14Sds)D + 0.7Ex	Yes	Y	1	1.214			3	0.7				
7	(1.0+0.14Sds)D - 0.7Ex	Yes	Y	1	1.214			3	-0.7				
8	(1.0+0.14Sds)D + 0.7Ez	Yes	Y	1	1.214					4	0.7		
9	(1.0+0.14Sds)D - 0.7Ez	Yes	Y	1	1.214					4	-0.7		
10	(1.0+0.105Sds)D + 0.525Ex + 0.75L	Yes	Y	1	1.16	2	0.75	3	0.525				
11	(1.0+0.105Sds)D - 0.525Ex + 0.75L	Yes	Y	1	1.16	2	0.75	3	-0.525				
12	(1.0+0.105Sds)D + 0.525Ez + 0.75L	Yes	Y	1	1.16	2	0.75			4	0.525		
13	(1.0+0.105Sds)D - 0.525Ez + 0.75L	Yes	Y	1	1.16	2	0.75			4	-0.525		
14	(0.9-0.14Sds)D + 0.7Ex	Yes	Y	1	0.686			3	0.7				
15	(0.9-0.14Sds)D - 0.7Ex	Yes	Y	1	0.686			3	-0.7				
16	(0.9-0.14Sds)D + 0.7Ez	Yes	Y	1	0.686					4	0.7		
17	(0.9-0.14Sds)D - 0.7Ez	Yes	Y	1	0.686					4	-0.7		
18	D + 0.6Wx	Yes	Y	1	1					5	1		
19	D - 0.6Wx	Yes	Y	1	1					5	-1		
20	D + 0.6Wz	Yes	Y	1	1					6	1		
21	D - 0.6Wz	Yes	Y	1	1					6	-1		
22	D + 0.75L + 0.45Wx	Yes	Y	1	1	2	0.75			5	0.45		
23	D + 0.75L - 0.45Wx	Yes	Y	1	1	2	0.75			5	-0.45		
24	D + 0.75L + 0.45Wz	Yes	Y	1	1	2	0.75			6	0.45		
25	D + 0.75L - 0.45Wz	Yes	Y	1	1	2	0.75			6	-0.45		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
26	0.6D + 0.6Wx	Yes	Y	1	0.6					5	0.6		
27	0.6D - 0.6Wx	Yes	Y	1	0.6					5	-0.6		
28	0.6D + 0.6Wz	Yes	Y	1	0.6					6	0.6		
29	0.6D - 0.6Wz	Yes	Y	1	0.6					6	-0.6		
30	(1.0+0.14Sds)D + 0.7OmEx		Y	1	1.214			3	1.05				
31	(1.0+0.14Sds)D - 0.7OmEx		Y	1	1.214			3	-1.05				
32	(1.0+0.14Sds)D + 0.7OmEz		Y	1	1.214					4	1.05		
33	(1.0+0.14Sds)D - 0.7OmEz		Y	1	1.214					4	-1.05		
34	(1.0+0.105Sds)D + 0.525OmEx + 0.75L		Y	1	1.16	2	0.75	3	0.787				
35	(1.0+0.105Sds)D - 0.525OmEx + 0.75L		Y	1	1.16	2	0.75	3	-0.787				
36	(1.0+0.105Sds)D + 0.525OmEz + 0.75L		Y	1	1.16	2	0.75			4	0.787		
37	(1.0+0.105Sds)D - 0.525OmEz + 0.75L		Y	1	1.16	2	0.75			4	-0.787		
38	(0.9-0.14Sds)D + 0.7OmEx		Y	1	0.686			3	1.05				
39	(0.9-0.14Sds)D - 0.7OmEx		Y	1	0.686			3	-1.05				
40	(0.9-0.14Sds)D + 0.7OmEz		Y	1	0.686					4	1.05		
41	(0.9-0.14Sds)D - 0.7OmEz		Y	1	0.686					4	-1.05		
42			Y										
43	1.4D		Y	1	1.4								
44	1.2D + 1.6L		Y	1	1.2	2	1.6						
45	(1.2+0.2Sds)D + Ex + 0.5L		Y	1	1.505	2	0.5	3	1				
46	(1.2+0.2Sds)D - Ex + 0.5L		Y	1	1.505	2	0.5	3	-1				
47	(1.2+0.2Sds)D + Ez + 0.5L		Y	1	1.505	2	0.5			4	1		
48	(1.2+0.2Sds)D - Ez + 0.5L		Y	1	1.505	2	0.5			4	-1		
49	(0.9-0.2Sds)D + Ex		Y	1	0.595			3	1				
50	(0.9-0.2Sds)D - Ex		Y	1	0.595			3	-1				
51	(0.9-0.2Sds)D + Ez		Y	1	0.595					4	1		
52	(0.9-0.2Sds)D - Ez		Y	1	0.595					4	-1		
53	1.2D + Wx + 0.5L		Y	1	1.2	2	0.5					5	1
54	1.2D - Wx + 0.5L		Y	1	1.2	2	0.5					5	-1
55	1.2D + Wz + 0.5L		Y	1	1.2	2	0.5					6	1
56	1.2D - Wz + 0.5L		Y	1	1.2	2	0.5					6	-1
57	0.9D + Wx		Y	1	0.9							5	1
58	0.9D - Wx		Y	1	0.9							5	-1
59	0.9D + Wz		Y	1	0.9							6	1
60	0.9D - Wz		Y	1	0.9							6	-1
61	(1.2+0.2Sds)D + OmEx + 0.5L		Y	1	1.505	2	0.5	3	1.5				
62	(1.2+0.2Sds)D - OmEx + 0.5L		Y	1	1.505	2	0.5	3	-1.5				
63	(1.2+0.2Sds)D + OmEz + 0.5L		Y	1	1.505	2	0.5			4	1.5		
64	(1.2+0.2Sds)D - OmEz + 0.5L		Y	1	1.505	2	0.5			4	-1.5		
65	(0.9-0.2Sds)D + OmEx		Y	1	0.595			3	1.5				
66	(0.9-0.2Sds)D - OmEx		Y	1	0.595			3	-1.5				
67	(0.9-0.2Sds)D + OmEz		Y	1	0.595					4	1.5		
68	(0.9-0.2Sds)D - OmEz		Y	1	0.595					4	-1.5		

Envelope Maximum Member Section Forces

	Member		Axial[k]	Loc[ft]	LC	y Shear[k]	Loc[ft]	LC	z Shear[k]	Loc[ft]	LC	Torque[k-ft]	Loc[ft]	LC	y-y Moment[k-ft]	Loc[ft]	LC	z-z Moment[k-ft]	Loc[ft]	LC
0	M1	max	0.841	6	18	0.648	8	19	0.29	8	12	0.01	8	9	0.386	6	17	1.252	6	19
1		min	-0.641	8	19	-0.593	6	18	-0.196	6	17	-0.01	6	8	-0.583	6	12	-1.129	6	18
2	M2	max	0.829	0	18	0.514	12	19	0.412	12	8	0.008	12	19	0.719	10	17	1.05	10	19
3		min	-0.329	10	19	-0.678	10	18	-0.353	10	17	-0.011	10	18	-0.828	10	8	-1.394	10	18
4	M5	max	0.829	0	18	0.514	12	19	0.353	12	16	0.011	12	18	0.828	10	9	1.05	10	19
5		min	-0.329	10	19	-0.678	10	18	-0.412	10	9	-0.008	10	19	-0.719	10	16	-1.394	10	18
6	M6	max	0.841	6	18	0.648	8	19	0.196	8	16	0.01	8	9	0.583	6	13	1.252	6	19
7		min	-0.641	8	19	-0.593	6	18	-0.29	6	13	-0.01	6	8	-0.386	6	16	-1.129	6	18
8	M8	max	0.367	2	16	0.135	2	18	0.466	6	12	0.061	10	18	0.504	10	13	0.36	10	19

Envelope Maximum Member Section Forces (Continued)

	Member		Axial[k]	Loc[ft]	LC	y Shear[k]	Loc[ft]	LC	z Shear[k]	Loc[ft]	LC	Torque[k-ft]	Loc[ft]	LC	y-y Moment[k-ft]	Loc[ft]	LC	z-z Moment[k-ft]	Loc[ft]	LC
9		min	-1.047	8	13	-0.135	14	18	-0.466	10	13	-0.061	6	18	-0.739	2	12	-0.384	10	18
10	M9	max	0.24	10	19	0.123	2	18	0.403	6	12	0.073	2	18	0.44	10	13	0.37	10	19
11		min	-0.887	8	13	-0.123	14	18	-0.403	10	13	-0.073	14	18	-0.546	14	13	-0.396	10	18
12	M15	max	0.898	0	18	0.424	0	18	0.018	0	9	0.033	3.162	9	0.045	7.115	17	1.014	3.162	19
13		min	-0.932	3.162	19	-0.34	9.487	18	-0.018	0	8	-0.035	9.487	18	-0.048	7.115	8	-1.202	3.162	18
14	M17	max	0.115	0	11	0.343	0	22	0.032	12.649	16	0	12.649	17	0.1	6.325	17	0.412	6.325	19
15		min	-0.105	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	8	-0.1	6.325	8	-1.085	6.325	22
16	M19	max	0.116	0	11	0.343	0	22	0.032	12.649	16	0	12.649	8	0.1	6.325	17	0.412	6.325	19
17		min	-0.104	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	17	-0.1	6.325	8	-1.085	6.325	22
18	M21	max	0.101	0	11	0.343	0	22	0.032	12.649	16	0	12.649	8	0.1	6.325	17	0.412	6.325	19
19		min	-0.119	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	17	-0.1	6.325	8	-1.085	6.325	22
20	M22	max	0.98	0	18	0.539	0	18	0.035	0	9	0.024	9.487	8	0.098	6.983	9	1.259	3.162	19
21		min	-1.082	12.649	18	-0.459	9.487	18	-0.035	0	8	-0.024	3.162	9	-0.098	6.983	8	-1.463	3.162	18
22	M23	max	0.115	0	11	0.343	0	22	0.032	12.649	16	0	12.649	9	0.1	6.325	17	0.412	6.325	19
23		min	-0.105	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	16	-0.1	6.325	8	-1.085	6.325	22
24	M24	max	0.898	0	18	0.424	0	18	0.018	0	9	0.035	12.649	18	0.048	7.115	9	1.014	3.162	19
25		min	-0.932	3.162	19	-0.34	9.487	18	-0.018	0	8	-0.033	0	8	-0.045	7.115	16	-1.202	3.162	18
26	M30	max	0.618	6	18	0.413	8	19	0.24	8	12	0.013	8	13	0.316	6	17	0.793	6	19
27		min	-0.463	8	19	-0.405	6	18	-0.164	6	17	-0.009	6	16	-0.499	6	12	-0.772	6	18
28	M31	max	1.086	0	22	0.39	10	19	0.522	10	12	0.005	10	19	0.784	8.021	17	0.804	7.917	19
29		min	-0.281	7.917	19	-0.404	8.021	18	-0.388	8.021	17	-0.016	8.021	22	-0.985	8.021	12	-0.835	7.917	18
30	M32	max	0.553	0	12	0.19	12	19	0.319	12	8	0.006	12	11	0.551	10	17	0.384	10	19
31		min	-0.131	10	19	-0.216	10	18	-0.267	10	17	-0.002	10	14	-0.664	10	8	-0.438	10	18
32	M33	max	1.164	0	11	0.709	8	19	0.221	8	16	0.007	8	17	0.516	6	9	1.45	6	19
33		min	-0.745	8	19	-0.714	6	18	-0.249	6	9	-0.008	6	8	-0.455	6	16	-1.466	6	18
34	M34	max	2.513	0	22	0.733	10	19	0.513	10	16	0.011	10	13	1.087	8.021	9	1.42	7.917	19
35		min	-0.81	7.917	19	-0.779	8.021	18	-0.566	8.021	9	-0.005	8.021	16	-0.995	8.021	16	-1.505	7.917	18
36	M35	max	1.243	0	22	0.356	12	19	0.325	12	16	0.004	12	19	0.729	10	9	0.711	10	19
37		min	-0.375	10	19	-0.404	10	18	-0.352	10	9	-0.005	10	18	-0.673	10	16	-0.805	10	18
38	M36	max	0.553	0	13	0.19	12	19	0.267	12	16	0.002	12	14	0.664	10	9	0.384	10	19
39		min	-0.131	10	19	-0.216	10	18	-0.319	10	9	-0.006	10	11	-0.551	10	16	-0.438	10	18
40	M37	max	1.086	0	22	0.39	10	19	0.388	10	16	0.016	10	22	0.985	8.021	13	0.804	7.917	19
41		min	-0.281	7.917	19	-0.404	8.021	18	-0.522	8.021	13	-0.005	8.021	19	-0.784	8.021	16	-0.835	7.917	18
42	M38	max	0.618	6	18	0.413	8	19	0.164	8	16	0.009	8	17	0.499	6	13	0.793	6	19
43		min	-0.463	8	19	-0.405	6	18	-0.24	6	13	-0.013	6	12	-0.316	6	16	-0.772	6	18
44	M39	max	0.28	2	16	0.063	2	18	0.315	6	12	0.034	2	18	0.318	2	17	0.143	4	19
45		min	-0.62	6	12	-0.065	0	19	-0.282	0	12	-0.035	0	19	-0.549	2	12	-0.138	4	18
46	M40	max	0.28	8	17	0.065	8	19	0.282	8	13	0.035	8	19	0.318	6	16	0.143	4	19
47		min	-0.62	0	13	-0.063	6	18	-0.315	2	13	-0.034	6	18	-0.549	6	13	-0.138	4	18
48	M41	max	0.4	2	16	0.091	2	18	0.522	6	12	0.033	8	19	0.481	2	17	0.165	4	19
49		min	-1.084	6	12	-0.082	0	19	-0.424	0	12	-0.036	2	18	-0.832	2	12	-0.183	4	18
50	M42	max	0.181	2	16	0.063	8	19	0.273	6	12	0.067	2	18	0.248	6	12	0.139	4	19
51		min	-0.536	6	12	-0.063	6.083	18	-0.212	0	12	-0.064	0	19	-0.408	2	12	-0.128	4	18
52	M43	max	0.181	8	17	0.063	1.917	18	0.212	8	13	0.064	8	19	0.248	2	13	0.139	4	19
53		min	-0.536	0	13	-0.063	0	19	-0.273	2	13	-0.067	6	18	-0.408	6	13	-0.128	4	18
54	M44	max	0.57	0	18	0.377	0	18	0.018	0	9	0.036	2.062	17	0.031	2.062	9	0.639	2.062	19
55		min	-0.574	2.062	19	-0.32	6.185	18	-0.017	0	8	-0.053	0	12	-0.03	2.062	8	-0.717	2.062	18
56	M45	max	0.073	0	11	0.227	0	22	0.021	0	17	0.001	8.246	19	0.042	4.123	17	0.173	4.123	19
57		min	-0.055	8.246	13	-0.227	8.246	22	-0.021	0	8	-0.001	0	22	-0.042	4.123	8	-0.469	4.123	22
58	M46	max	0.08	0	11	0.227	0	22	0.021	0	17	0.001	8.246	12	0.042	4.123	17	0.173	4.123	19
59		min	-0.037	8.246	11	-0.227	8.246	22	-0.021	0	8	-0.001	0	17	-0.042	4.123	8	-0.469	4.123	22
60	M47	max	0.05	0	11	0.227	0	22	0.021	0	17	0.001	8.246	22	0.042	4.123	17	0.173	4.123	19
61		min	-0.075	8.246	12	-0.227	8.246	22	-0.021	0	8	0	0	19	-0.042	4.123	8	-0.469	4.123	22
62	M48	max	1.042	0	18	0.665	0	18	0.03	0	9	0.033	2.062	9	0.051	2.062	9	1.138	2.062	19
63		min	-1.015	2.062	19	-0.57	6.185	18	-0.03	0	8	-0.028	0	16	-0.052	2.062	8	-1.266	2.062	18

Envelope Maximum Member Section Forces (Continued)

	Member		Axial[k]	Loc[ft]	LC	y Shear[k]	Loc[ft]	LC	z Shear[k]	Loc[ft]	LC	Torque[k-ft]	Loc[ft]	LC	y-y Moment[k-ft]	Loc[ft]	LC	z-z Moment[k-ft]	Loc[ft]	LC
64	M49	max	0.053	0	11	0.227	0	22	0.021	0	17	0	8.246	22	0.042	4.123	17	0.173	4.123	19
65		min	-0.065	8.246	3	-0.227	8.246	22	-0.021	0	8	0	0	19	-0.042	4.123	8	-0.469	4.123	22
66	M50	max	0.075	0	11	0.227	0	22	0.021	0	17	0	8.246	8	0.042	4.123	17	0.173	4.123	19
67		min	-0.043	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	9	-0.042	4.123	8	-0.469	4.123	22
68	M51	max	0.053	0	11	0.227	0	22	0.021	0	17	0	8.246	19	0.042	4.123	17	0.173	4.123	19
69		min	-0.065	8.246	3	-0.227	8.246	22	-0.021	0	8	0	0	22	-0.042	4.123	8	-0.469	4.123	22
70	M52	max	1.042	0	18	0.665	0	18	0.03	0	9	0.028	2.062	17	0.052	2.062	9	1.138	2.062	19
71		min	-1.015	2.062	19	-0.57	6.185	18	-0.03	0	8	-0.033	0	8	-0.051	2.062	8	-1.266	2.062	18
72	M53	max	0.05	0	11	0.227	0	22	0.021	0	17	0	8.246	19	0.042	4.123	17	0.173	4.123	19
73		min	-0.075	8.246	13	-0.227	8.246	22	-0.021	0	8	-0.001	0	22	-0.042	4.123	8	-0.469	4.123	22
74	M54	max	0.08	0	11	0.227	0	22	0.021	0	17	0.001	8.246	16	0.042	4.123	17	0.173	4.123	19
75		min	-0.037	8.246	11	-0.227	8.246	22	-0.021	0	8	-0.001	0	13	-0.042	4.123	8	-0.469	4.123	22
76	M55	max	0.57	0	18	0.377	0	18	0.017	0	9	0.053	2.062	13	0.03	2.062	9	0.639	2.062	19
77		min	-0.574	2.062	19	-0.32	6.185	18	-0.018	0	8	-0.036	0	16	-0.031	2.062	8	-0.717	2.062	18
78	M56	max	0.876	3.202	19	0.005	0	7	0	3.202	29	0.049	3.202	16	0	3.202	29	0	3.202	29
79		min	-0.86	0	18	-0.005	3.202	6	0	0	1	-0.054	0	9	0	0	1	-0.004	1.601	7
80	M57	max	1.525	3.202	19	0.005	0	7	0	3.202	29	0.068	3.202	16	0	3.202	29	0	3.202	29
81		min	-1.534	0	18	-0.005	3.202	6	0	0	1	-0.071	0	9	0	0	1	-0.004	1.601	7
82	M58	max	0.876	3.202	19	0.005	0	6	0	3.202	29	0.054	3.202	8	0	3.202	29	0	3.202	29
83		min	-0.86	0	18	-0.005	3.202	9	0	0	1	-0.049	0	17	0	0	1	-0.004	1.601	6
84	M59	max	0.688	2.5	18	0.005	0	9	0	2.5	29	0.055	2.5	18	0	2.5	29	0	2.5	29
85		min	-0.48	0	19	-0.005	2.5	7	0	0	1	-0.052	0	19	0	0	1	-0.003	1.25	9
86	M60	max	0.372	3.202	11	0.005	0	7	0	3.202	29	0.024	3.202	18	0	3.202	29	0	3.202	29
87		min	-0.043	0	14	-0.005	3.202	8	0	0	1	-0.029	0	19	0	0	1	-0.004	1.601	7
88	M61	max	0.326	2.5	18	0.005	0	7	0	2.5	29	0.067	2.5	18	0	2.5	29	0	2.5	29
89		min	-0.289	0	19	-0.005	2.5	8	0	0	1	-0.059	0	19	0	0	1	-0.003	1.25	7
90	M62	max	0.602	2.5	18	0.005	0	7	0	2.5	29	0.029	2.5	19	0	2.5	29	0	2.5	29
91		min	-0.538	0	19	-0.005	2.5	6	0	0	1	-0.031	0	18	0	0	1	-0.003	1.25	7
92	M63	max	0.629	3.202	11	0.005	0	7	0	3.202	29	0.019	3.202	19	0	3.202	29	0	3.202	29
93		min	-0.136	0	14	-0.005	3.202	6	0	0	1	-0.024	0	18	0	0	1	-0.004	1.601	7
94	M64	max	1.226	2.5	18	0.005	0	6	0	2.5	29	0.046	2.5	8	0	2.5	29	0	2.5	29
95		min	-0.932	0	19	-0.005	2.5	9	0	0	1	-0.047	0	9	0	0	1	-0.003	1.25	6
96	M65	max	0.688	2.5	18	0.005	0	7	0	2.5	29	0.052	2.5	19	0	2.5	29	0	2.5	29
97		min	-0.48	0	19	-0.005	2.5	6	0	0	1	-0.055	0	18	0	0	1	-0.003	1.25	7
98	M66	max	0.372	3.202	11	0.005	0	6	0	3.202	29	0.029	3.202	19	0	3.202	29	0	3.202	29
99		min	-0.043	0	14	-0.005	3.202	7	0	0	1	-0.024	0	18	0	0	1	-0.004	1.601	6
100	M67	max	0.326	2.5	18	0.005	0	8	0	2.5	29	0.059	2.5	19	0	2.5	29	0	2.5	29
101		min	-0.289	0	19	-0.005	2.5	6	0	0	1	-0.067	0	18	0	0	1	-0.003	1.25	8
102	M68	max	1.164	0	11	0.709	8	19	0.249	8	8	0.008	8	9	0.455	6	17	1.45	6	19
103		min	-0.745	8	19	-0.714	6	18	-0.221	6	17	-0.007	6	16	-0.516	6	8	-1.466	6	18
104	M69	max	2.513	0	22	0.733	10	19	0.566	10	8	0.005	10	17	0.995	8.021	17	1.42	7.917	19
105		min	-0.81	7.917	19	-0.779	8.021	18	-0.513	8.021	17	-0.011	8.021	12	-1.087	8.021	8	-1.505	7.917	18
106	M70	max	1.243	0	22	0.356	12	19	0.352	12	8	0.005	12	18	0.673	10	17	0.711	10	19
107		min	-0.375	10	19	-0.404	10	18	-0.325	10	17	-0.004	10	19	-0.729	10	8	-0.805	10	18
108	M71	max	1.525	3.202	19	0.005	0	7	0	3.202	29	0.071	3.202	8	0	3.202	29	0	3.202	29
109		min	-1.534	0	18	-0.005	3.202	6	0	0	1	-0.068	0	17	0	0	1	-0.004	1.601	7
110	M72	max	0.602	2.5	18	0.005	0	9	0	2.5	29	0.031	2.5	18	0	2.5	29	0	2.5	29
111		min	-0.538	0	19	-0.005	2.5	8	0	0	1	-0.029	0	19	0	0	1	-0.003	1.25	9
112	M73	max	0.629	3.202	11	0.005	0	7	0	3.202	29	0.024	3.202	18	0	3.202	29	0	3.202	29
113		min	-0.136	0	14	-0.005	3.202	6	0	0	1	-0.019	0	19	0	0	1	-0.004	1.601	7
114	M74	max	1.226	2.5	18	0.005	0	6	0	2.5	29	0.047	2.5	8	0	2.5	29	0	2.5	29
115		min	-0.932	0	19	-0.005	2.5	7	0	0	1	-0.046	0	9	0	0	1	-0.003	1.25	6
116	M75	max	0.4	8	17	0.082	8	19	0.424	8	13	0.036	4	18	0.481	6	16	0.165	4	19
117		min	-1.084	0	13	-0.091	6	18	-0.522	2	13	-0.033	0	19	-0.832	6	13	-0.183	4	18
118	M76	max	0.073	0	11	0.227	0	22	0.021	0	17	0.001	8.246	22	0.042	4.123	17	0.173	4.123	19

Envelope Maximum Member Section Forces (Continued)

	Member		Axial[k]	Loc[ft]	LC	y Shear[k]	Loc[ft]	LC	z Shear[k]	Loc[ft]	LC	Torque[k-ft]	Loc[ft]	LC	y-y Moment[k-ft]	Loc[ft]	LC	z-z Moment[k-ft]	Loc[ft]	LC
119		min	-0.055	8.246	12	-0.227	8.246	22	-0.021	0	8	-0.001	0	19	-0.042	4.123	8	-0.469	4.123	22
120	M77	max	0.051	0	11	0.227	0	22	0.021	0	17	0	8.246	19	0.042	4.123	17	0.173	4.123	19
121		min	-0.067	8.246	11	-0.227	8.246	22	-0.021	0	8	-0.001	0	22	-0.042	4.123	8	-0.469	4.123	22
122	M78	max	0.047	0	11	0.227	0	22	0.021	0	17	0.001	8.246	13	0.042	4.123	17	0.173	4.123	19
123		min	-0.071	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	16	-0.042	4.123	8	-0.469	4.123	22
124	M79	max	0.065	0	11	0.227	0	22	0.021	0	17	0.001	8.246	22	0.042	4.123	17	0.173	4.123	19
125		min	-0.053	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	19	-0.042	4.123	8	-0.469	4.123	22
126	M80	max	0.44	6.185	19	0.249	6.185	18	0.022	8.246	8	0.035	2.062	13	0.035	6.185	17	0.409	6.185	18
127		min	-0.497	8.246	18	-0.243	6.185	19	-0.022	8.246	17	-0.028	0	16	-0.035	6.185	8	-0.469	6.185	19
128	M81	max	0.06	0	11	0.227	0	22	0.021	0	17	0	8.246	22	0.042	4.123	17	0.173	4.123	19
129		min	-0.058	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	19	-0.042	4.123	8	-0.469	4.123	22
130	M82	max	0.048	0	11	0.227	0	22	0.021	0	17	0	8.246	9	0.042	4.123	17	0.173	4.123	19
131		min	-0.07	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	8	-0.042	4.123	8	-0.469	4.123	22
132	M83	max	0.06	0	11	0.227	0	22	0.021	0	17	0	8.246	19	0.042	4.123	17	0.173	4.123	19
133		min	-0.058	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	22	-0.042	4.123	8	-0.469	4.123	22
134	M84	max	0.44	6.185	19	0.249	6.185	18	0.022	8.246	16	0.028	2.062	17	0.035	6.185	9	0.409	6.185	18
135		min	-0.497	8.246	18	-0.243	6.185	19	-0.022	8.246	9	-0.035	0	12	-0.035	6.185	16	-0.469	6.185	19
136	M85	max	0.065	0	11	0.227	0	22	0.021	0	17	0	8.246	19	0.042	4.123	17	0.173	4.123	19
137		min	-0.053	8.246	11	-0.227	8.246	22	-0.021	0	8	-0.001	0	22	-0.042	4.123	8	-0.469	4.123	22
138	M86	max	0.047	0	11	0.227	0	22	0.021	0	17	0	8.246	17	0.042	4.123	17	0.173	4.123	19
139		min	-0.071	8.246	11	-0.227	8.246	22	-0.021	0	8	-0.001	0	12	-0.042	4.123	8	-0.469	4.123	22
140	M87	max	0.237	6.185	19	0.135	6.185	18	0.012	8.246	8	0.042	2.062	13	0.03	6.185	19	0.219	6.185	18
141		min	-0.268	8.246	18	-0.137	6.185	19	-0.012	8.246	17	-0.026	2.062	19	-0.036	6.185	18	-0.273	6.185	19
142	M88	max	0.237	6.185	19	0.135	6.185	18	0.012	8.246	16	0.026	6.185	19	0.036	6.185	18	0.219	6.185	18
143		min	-0.268	8.246	18	-0.137	6.185	19	-0.012	8.246	9	-0.042	0	12	-0.03	6.185	19	-0.273	6.185	19
144	M89	max	0.051	0	11	0.227	0	22	0.021	0	17	0.001	8.246	22	0.042	4.123	17	0.173	4.123	19
145		min	-0.067	8.246	11	-0.227	8.246	22	-0.021	0	8	0	0	19	-0.042	4.123	8	-0.469	4.123	22
146	M90	max	0.091	2	19	0.072	1.917	18	0.148	6	12	0.029	2	18	0.214	2	13	0.148	4	19
147		min	-0.424	0	22	-0.072	6.083	18	-0.148	2	13	-0.029	6	18	-0.079	4	22	-0.149	4	18
148	M91	max	0.253	8	19	0.064	8	19	0.275	6	12	0.03	2	18	0.414	2	13	0.152	4	19
149		min	-0.856	6	22	-0.064	0	19	-0.275	2	13	-0.03	6	18	-0.151	4	22	-0.154	4	18
150	M92	max	0.117	8	19	0.06	1.917	18	0.154	6	12	0.01	2	18	0.255	2	13	0.146	4	19
151		min	-0.466	6	22	-0.06	6.083	18	-0.154	2	13	-0.01	6	18	-0.082	2	16	-0.141	4	18
152	M93	max	0.461	0	13	0.005	0	9	0	2.828	29	0.048	2.828	9	0	2.828	29	0	2.828	29
153		min	-0.309	2.828	16	-0.005	2.828	6	0	0	1	-0.04	0	18	0	0	1	-0.003	1.414	6
154	M94	max	0.833	0	12	0.005	0	9	0	2.828	29	0.031	2.828	17	0	2.828	29	0	2.828	29
155		min	-0.176	2.828	19	-0.005	2.828	6	0	0	1	-0.035	0	8	0	0	1	-0.003	1.414	6
156	M95	max	0.646	0	22	0.005	0	9	0	2.828	29	0.04	2.828	19	0	2.828	29	0	2.828	29
157		min	-0.155	2.828	19	-0.005	2.828	6	0	0	1	-0.041	0	18	0	0	1	-0.003	1.414	6
158	M96	max	0.646	0	22	0.005	0	9	0	2.828	29	0.041	2.828	18	0	2.828	29	0	2.828	29
159		min	-0.155	2.828	19	-0.005	2.828	6	0	0	1	-0.04	0	19	0	0	1	-0.003	1.414	6
160	M97	max	0.833	0	13	0.005	0	9	0	2.828	29	0.035	2.828	9	0	2.828	29	0	2.828	29
161		min	-0.176	2.828	19	-0.005	2.828	6	0	0	1	-0.031	0	16	0	0	1	-0.003	1.414	6
162	M98	max	0.461	0	12	0.005	0	9	0	2.828	29	0.04	2.828	18	0	2.828	29	0	2.828	29
163		min	-0.309	2.828	17	-0.005	2.828	6	0	0	1	-0.048	0	8	0	0	1	-0.003	1.414	6
164	M99	max	0.91	0	13	0.005	0	9	0	2.828	29	0.083	2.828	19	0	2.828	29	0	2.828	29
165		min	-0.686	2.828	16	-0.005	2.828	6	0	0	1	-0.09	0	18	0	0	1	-0.003	1.414	6
166	M100	max	1.628	0	12	0.005	0	9	0	2.828	29	0.022	2.828	9	0	2.828	29	0	2.828	29
167		min	-0.434	2.828	19	-0.005	2.828	6	0	0	1	-0.021	0	8	0	0	1	-0.003	1.414	6
168	M101	max	1.258	0	22	0.005	0	9	0	2.828	29	0.042	2.828	19	0	2.828	29	0	2.828	29
169		min	-0.374	2.828	19	-0.005	2.828	6	0	0	1	-0.043	0	18	0	0	1	-0.003	1.414	6
170	M102	max	1.258	0	22	0.005	0	9	0	2.828	29	0.043	2.828	18	0	2.828	29	0	2.828	29
171		min	-0.374	2.828	19	-0.005	2.828	6	0	0	1	-0.042	0	19	0	0	1	-0.003	1.414	6
172	M103	max	1.628	0	13	0.005	0	9	0	2.828	29	0.021	2.828	9	0	2.828	29	0	2.828	29
173		min	-0.434	2.828	19	-0.005	2.828	6	0	0	1	-0.022	0	8	0	0	1	-0.003	1.414	6

Envelope Maximum Member Section Forces (Continued)

	Member		Axial[k]	Loc[ft]	LC	y Shear[k]	Loc[ft]	LC	z Shear[k]	Loc[ft]	LC	Torque[k-ft]	Loc[ft]	LC	y-y Moment[k-ft]	Loc[ft]	LC	z-z Moment[k-ft]	Loc[ft]	LC
174	M104	max	0.91	0	12	0.005	0	9	0	2.828	29	0.09	2.828	18	0	2.828	29	0	2.828	29
175		min	-0.686	2.828	17	-0.005	2.828	6	0	0	1	-0.083	0	19	0	0	1	-0.003	1.414	6
176	M105	max	0.548	0	9	0.005	0	9	0	2.828	29	0.055	2.828	19	0	2.828	29	0	2.828	29
177		min	-0.459	2.828	16	-0.005	2.828	6	0	0	1	-0.059	0	18	0	0	1	-0.003	1.414	6
178	M106	max	0.92	0	12	0.005	0	9	0	2.828	29	0.018	2.828	19	0	2.828	29	0	2.828	29
179		min	-0.264	2.828	17	-0.005	2.828	6	0	0	1	-0.019	0	18	0	0	1	-0.003	1.414	6
180	M107	max	0.678	0	13	0.005	0	9	0	2.828	29	0.013	2.828	19	0	2.828	29	0	2.828	29
181		min	-0.159	2.828	19	-0.005	2.828	6	0	0	1	-0.014	0	18	0	0	1	-0.003	1.414	6
182	M108	max	0.678	0	12	0.005	0	9	0	2.828	29	0.014	2.828	18	0	2.828	29	0	2.828	29
183		min	-0.159	2.828	19	-0.005	2.828	6	0	0	1	-0.013	0	19	0	0	1	-0.003	1.414	6
184	M109	max	0.92	0	13	0.005	0	9	0	2.828	29	0.019	2.828	18	0	2.828	29	0	2.828	29
185		min	-0.264	2.828	16	-0.005	2.828	6	0	0	1	-0.018	0	19	0	0	1	-0.003	1.414	6
186	M110	max	0.548	0	8	0.005	0	9	0	2.828	29	0.059	2.828	18	0	2.828	29	0	2.828	29
187		min	-0.459	2.828	17	-0.005	2.828	6	0	0	1	-0.055	0	19	0	0	1	-0.003	1.414	6
188	M113	max	0.7	0	9	0.005	0	9	0	2.828	29	0.036	2.828	19	0	2.828	29	0	2.828	29
189		min	-0.602	2.828	16	-0.005	2.828	6	0	0	1	-0.044	0	18	0	0	1	-0.003	1.414	6
190	M115	max	0.551	0	13	0.005	0	9	0	2.828	29	0.029	2.828	19	0	2.828	29	0	2.828	29
191		min	-0.371	2.828	16	-0.005	2.828	6	0	0	1	-0.024	0	18	0	0	1	-0.003	1.414	6
192	M116	max	0.551	0	12	0.005	0	9	0	2.828	29	0.024	2.828	18	0	2.828	29	0	2.828	29
193		min	-0.371	2.828	17	-0.005	2.828	6	0	0	1	-0.029	0	19	0	0	1	-0.003	1.414	6
194	M111	max	0.7	0	8	0.005	0	9	0	2.828	29	0.044	2.828	18	0	2.828	29	0	2.828	29
195		min	-0.602	2.828	17	-0.005	2.828	6	0	0	1	-0.036	0	19	0	0	1	-0.003	1.414	6
196	M117	max	0.101	0	11	0.343	0	22	0.032	12.649	16	0	12.649	16	0.1	6.325	17	0.412	6.325	19
197		min	-0.119	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	9	-0.1	6.325	8	-1.085	6.325	22
198	M118	max	0.116	0	11	0.343	0	22	0.032	12.649	16	0	12.649	16	0.1	6.325	17	0.412	6.325	19
199		min	-0.104	12.649	11	-0.343	12.649	22	-0.032	12.649	9	0	0	9	-0.1	6.325	8	-1.085	6.325	22
200	M119	max	1.85	0	3	0.724	8	19	0.439	8	8	0.029	8	9	0.687	6	9	1.534	6	19
201		min	-0.595	8	19	-0.62	6	18	-0.439	6	9	-0.029	6	8	-0.687	6	8	-1.353	6	18
202	M120	max	1.359	0	13	0.005	0	9	0	2.828	29	0.041	2.828	19	0	2.828	29	0	2.828	29
203		min	-0.366	2.828	19	-0.005	2.828	6	0	0	1	-0.035	0	18	0	0	1	-0.003	1.414	6
204	M121	max	2.187	0	22	0.704	12	19	0.69	12	8	0.007	12	9	1.04	10	9	1.362	10	19
205		min	-0.759	10	19	-0.931	10	18	-0.69	10	9	-0.007	10	8	-1.04	10	8	-1.787	10	18
206	M122	max	1.546	0	13	0.005	0	9	0	2.828	29	0.023	2.828	19	0	2.828	29	0	2.828	29
207		min	-0.377	2.828	19	-0.005	2.828	6	0	0	1	-0.034	0	18	0	0	1	-0.003	1.414	6
208	M123	max	1.359	0	12	0.005	0	9	0	2.828	29	0.035	2.828	18	0	2.828	29	0	2.828	29
209		min	-0.366	2.828	19	-0.005	2.828	6	0	0	1	-0.041	0	19	0	0	1	-0.003	1.414	6
210	M124	max	1.546	0	12	0.005	0	9	0	2.828	29	0.034	2.828	18	0	2.828	29	0	2.828	29
211		min	-0.377	2.828	19	-0.005	2.828	6	0	0	1	-0.023	0	19	0	0	1	-0.003	1.414	6
212	M112	max	0.858	0	18	0.007	0	7	0	3.162	29	0.063	3.162	18	0	3.162	29	0	3.162	29
213		min	-0.655	3.162	19	-0.007	3.162	6	0	0	1	-0.056	0	19	0	0	1	-0.006	1.581	7
214	M114	max	1.154	0	18	0.007	0	7	0	3.162	29	0.027	3.162	8	0	3.162	29	0	3.162	29
215		min	-0.893	3.162	19	-0.007	3.162	9	0	0	1	-0.027	0	9	0	0	1	-0.006	1.581	7
216	M125	max	0.858	0	18	0.007	0	8	0	3.162	29	0.056	3.162	19	0	3.162	29	0	3.162	29
217		min	-0.655	3.162	19	-0.007	3.162	7	0	0	1	-0.063	0	18	0	0	1	-0.006	1.581	8
218	M126	max	1.215	0	19	0.007	0	9	0	4.243	29	0.04	4.243	8	0	4.243	29	0	4.243	29
219		min	-1.109	4.243	18	-0.007	4.243	6	0	0	1	-0.033	0	17	0	0	1	-0.008	2.121	6
220	M127	max	1.392	0	19	0.007	0	9	0	4.243	29	0.051	4.243	8	0	4.243	29	0	4.243	29
221		min	-1.194	4.243	18	-0.007	4.243	6	0	0	1	-0.051	0	9	0	0	1	-0.008	2.121	6
222	M128	max	1.215	0	19	0.007	0	9	0	4.243	29	0.033	4.243	16	0	4.243	29	0	4.243	29
223		min	-1.109	4.243	18	-0.007	4.243	6	0	0	1	-0.04	0	9	0	0	1	-0.008	2.121	6

Envelope Member End Reactions

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
0	M1	I	max	0.688	12	0.188	18	0.064	17	0	29	0	29	0	29
1			min	0.046	17	-0.209	19	-0.097	12	0	1	0	1	0	1

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
2		J	max	0.826	18	0.648	19	0.29	12	0.01	9	0.031	8	0.073	18
3			min	-0.641	19	-0.593	18	-0.196	17	-0.01	8	-0.031	9	-0.063	19
4	M2	I	max	0.829	18	0.139	18	0.071	17	0	29	0	29	0	29
5			min	-0.255	19	-0.105	19	-0.082	8	0	1	0	1	0	1
6		J	max	0.514	13	0.514	19	0.412	8	0.008	19	0.033	18	0.005	14
7			min	-0.177	16	-0.678	18	-0.353	17	-0.011	18	-0.023	19	-0.027	11
8	M5	I	max	0.829	18	0.139	18	0.082	9	0	29	0	29	0	29
9			min	-0.255	19	-0.105	19	-0.071	16	0	1	0	1	0	1
10		J	max	0.514	12	0.514	19	0.353	16	0.011	18	0.023	19	0.005	14
11			min	-0.177	17	-0.678	18	-0.412	9	-0.008	19	-0.033	18	-0.027	11
12	M6	I	max	0.688	13	0.188	18	0.097	13	0	29	0	29	0	29
13			min	0.046	16	-0.209	19	-0.064	16	0	1	0	1	0	1
14		J	max	0.826	18	0.648	19	0.196	16	0.01	9	0.031	8	0.073	18
15			min	-0.641	19	-0.593	18	-0.29	13	-0.01	8	-0.031	9	-0.063	19
16	M8	I	max	0.367	16	0.135	18	0.212	17	0.005	14	0	29	0	29
17			min	-0.426	9	-0.128	19	-0.378	12	-0.027	11	0	1	0	1
18		J	max	0.367	17	0.128	19	0.378	13	0.027	11	0	29	0	29
19			min	-0.426	8	-0.135	18	-0.212	16	-0.005	14	0	1	0	1
20	M9	I	max	0.214	16	0.123	18	0.134	17	0.073	18	0	29	0	29
21			min	-0.304	13	-0.122	19	-0.281	12	-0.063	19	0	1	0	1
22		J	max	0.214	17	0.122	19	0.281	13	0.063	19	0	29	0	29
23			min	-0.304	12	-0.123	18	-0.134	16	-0.073	18	0	1	0	1
24	M15	I	max	0.898	18	0.424	18	0.018	9	0.033	9	0	29	0	29
25			min	-0.919	19	-0.328	19	-0.018	8	-0.032	8	0	1	0	1
26		J	max	0.63	19	0.08	18	0.014	8	0.024	19	0	29	0	29
27			min	-0.83	18	-0.138	19	-0.014	17	-0.035	18	0	1	0	1
28	M17	I	max	0.115	11	0.343	22	0.032	17	0	17	0	29	0	29
29			min	-0.012	14	-0.13	19	-0.032	8	0	8	0	1	0	1
30		J	max	0.015	14	0.13	19	0.032	16	0	17	0	29	0	29
31			min	-0.105	11	-0.343	22	-0.032	9	0	8	0	1	0	1
32	M19	I	max	0.116	11	0.343	22	0.032	17	0	8	0	29	0	29
33			min	-0.013	14	-0.13	19	-0.032	8	0	17	0	1	0	1
34		J	max	0.014	14	0.13	19	0.032	16	0	8	0	29	0	29
35			min	-0.104	11	-0.343	22	-0.032	9	0	17	0	1	0	1
36	M21	I	max	0.101	11	0.343	22	0.032	17	0	8	0	29	0	29
37			min	-0.016	14	-0.13	19	-0.032	8	0	17	0	1	0	1
38		J	max	0.011	14	0.13	19	0.032	16	0	8	0	29	0	29
39			min	-0.119	11	-0.343	22	-0.032	9	0	17	0	1	0	1
40	M22	I	max	0.98	18	0.539	18	0.035	9	0.022	9	0	29	0	29
41			min	-1.049	19	-0.423	19	-0.035	8	-0.022	8	0	1	0	1
42		J	max	0.827	19	0.073	18	0.029	16	0.002	16	0	29	0	29
43			min	-1.082	18	-0.186	11	-0.029	17	-0.002	17	0	1	0	1
44	M23	I	max	0.115	11	0.343	22	0.032	17	0	9	0	29	0	29
45			min	-0.012	14	-0.13	19	-0.032	8	0	16	0	1	0	1
46		J	max	0.015	14	0.13	19	0.032	16	0	9	0	29	0	29
47			min	-0.105	11	-0.343	22	-0.032	9	0	16	0	1	0	1
48	M24	I	max	0.898	18	0.424	18	0.018	9	0.032	9	0	29	0	29
49			min	-0.919	19	-0.328	19	-0.018	8	-0.033	8	0	1	0	1
50		J	max	0.63	19	0.08	18	0.014	16	0.035	18	0	29	0	29
51			min	-0.83	18	-0.138	19	-0.014	9	-0.024	19	0	1	0	1
52	M30	I	max	0.533	11	0.129	18	0.053	17	0	29	0	29	0	29
53			min	-0.024	14	-0.132	19	-0.083	12	0	1	0	1	0	1
54		J	max	0.603	18	0.413	19	0.24	12	0.013	13	0.035	16	0.067	18
55			min	-0.463	19	-0.405	18	-0.164	17	-0.009	16	-0.051	13	-0.064	19
56	M31	I	max	1.086	22	0.105	18	0.095	17	0	29	0	29	0	29

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
57			min	-0.223	19	-0.102	19	-0.122	12	0	1	0	1	0	1
58		J	max	0.412	13	0.39	19	0.522	12	0.005	19	0.065	22	0.027	18
59			min	-0.243	16	-0.404	18	-0.388	17	-0.016	22	-0.018	19	-0.026	19
60	M32	I	max	0.553	12	0.044	18	0.055	17	0	29	0	29	0	29
61			min	-0.058	19	-0.038	19	-0.066	8	0	1	0	1	0	1
62		J	max	0.347	13	0.19	19	0.319	8	0.006	11	0.01	14	0.034	18
63			min	-0.129	16	-0.216	18	-0.267	17	-0.002	14	-0.024	11	-0.035	19
64	M33	I	max	1.164	11	0.244	18	0.086	9	0	29	0	29	0	29
65			min	-0.03	14	-0.242	19	-0.076	16	0	1	0	1	0	1
66		J	max	0.793	18	0.709	19	0.221	16	0.007	17	0.032	8	0.004	14
67			min	-0.745	19	-0.714	18	-0.249	9	-0.008	8	-0.027	17	-0.016	11
68	M34	I	max	2.513	22	0.19	18	0.134	9	0	29	0	29	0	29
69			min	-0.751	19	-0.179	19	-0.122	16	0	1	0	1	0	1
70		J	max	0.059	19	0.733	19	0.513	16	0.011	13	0.021	16	0.066	18
71			min	-0.29	13	-0.779	18	-0.566	9	-0.005	16	-0.043	13	-0.063	19
72	M35	I	max	1.243	22	0.08	18	0.073	9	0	29	0	29	0	29
73			min	-0.301	19	-0.071	19	-0.067	16	0	1	0	1	0	1
74		J	max	0.149	19	0.356	19	0.325	16	0.004	19	0.019	18	0.012	11
75			min	-0.127	18	-0.404	18	-0.352	9	-0.005	18	-0.015	19	-0.001	14
76	M36	I	max	0.553	13	0.044	18	0.066	9	0	29	0	29	0	29
77			min	-0.058	19	-0.038	19	-0.055	16	0	1	0	1	0	1
78		J	max	0.347	12	0.19	19	0.267	16	0.002	14	0.024	11	0.034	18
79			min	-0.129	17	-0.216	18	-0.319	9	-0.006	11	-0.01	14	-0.035	19
80	M37	I	max	1.086	22	0.105	18	0.122	13	0	29	0	29	0	29
81			min	-0.223	19	-0.102	19	-0.095	16	0	1	0	1	0	1
82		J	max	0.412	12	0.39	19	0.388	16	0.016	22	0.018	19	0.027	18
83			min	-0.243	17	-0.404	18	-0.522	13	-0.005	19	-0.065	22	-0.026	19
84	M38	I	max	0.533	11	0.129	18	0.083	13	0	29	0	29	0	29
85			min	-0.024	14	-0.132	19	-0.053	16	0	1	0	1	0	1
86		J	max	0.603	18	0.413	19	0.164	16	0.009	17	0.051	12	0.067	18
87			min	-0.463	19	-0.405	18	-0.24	13	-0.013	12	-0.035	17	-0.064	19
88	M39	I	max	0.28	16	0.063	18	0.154	17	0.034	18	0	29	0	29
89			min	-0.331	9	-0.065	19	-0.282	12	-0.035	19	0	1	0	1
90		J	max	0.173	17	0.055	19	0.123	17	0.007	14	0	29	0	29
91			min	-0.62	12	-0.055	18	-0.137	8	-0.014	11	0	1	0	1
92	M40	I	max	0.173	16	0.055	18	0.137	9	0.014	11	0	29	0	29
93			min	-0.62	13	-0.055	19	-0.123	16	-0.007	14	0	1	0	1
94		J	max	0.28	17	0.065	19	0.282	13	0.035	19	0	29	0	29
95			min	-0.331	8	-0.063	18	-0.154	16	-0.034	18	0	1	0	1
96	M41	I	max	0.4	16	0.091	18	0.235	17	0.027	18	0	29	0	29
97			min	-0.53	13	-0.082	19	-0.424	12	-0.026	19	0	1	0	1
98		J	max	0.288	19	0.058	19	0.185	17	0.033	19	0	29	0	29
99			min	-1.084	12	-0.057	18	-0.229	12	-0.036	18	0	1	0	1
100	M42	I	max	0.181	16	0.056	18	0.109	17	0.067	18	0	29	0	29
101			min	-0.254	13	-0.062	19	-0.212	12	-0.064	19	0	1	0	1
102		J	max	0.105	19	0.063	19	0.091	17	0.032	18	0	29	0	29
103			min	-0.536	12	-0.063	18	-0.115	12	-0.022	19	0	1	0	1
104	M43	I	max	0.105	19	0.063	18	0.115	13	0.022	19	0	29	0	29
105			min	-0.536	13	-0.063	19	-0.091	16	-0.032	18	0	1	0	1
106		J	max	0.181	17	0.062	19	0.212	13	0.064	19	0	29	0	29
107			min	-0.254	12	-0.056	18	-0.109	16	-0.067	18	0	1	0	1
108	M44	I	max	0.57	18	0.377	18	0.018	9	0.036	17	0	29	0	29
109			min	-0.567	19	-0.314	19	-0.017	8	-0.053	12	0	1	0	1
110		J	max	0.398	19	0.149	18	0.009	19	0.017	17	0	29	0	29
111			min	-0.57	18	-0.134	19	-0.008	18	-0.042	12	0	1	0	1

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
112	M45	I	max	0.073	11	0.227	22	0.021	17	0.001	19	0	29	0	29
113			min	-0.017	14	-0.084	19	-0.021	8	-0.001	22	0	1	0	1
114		J	max	0.018	16	0.084	19	0.021	16	0.001	19	0	29	0	29
115			min	-0.055	13	-0.227	22	-0.021	9	-0.001	22	0	1	0	1
116	M46	I	max	0.08	11	0.227	22	0.021	17	0.001	12	0	29	0	29
117			min	-0.015	14	-0.084	19	-0.021	8	-0.001	17	0	1	0	1
118		J	max	0.008	14	0.084	19	0.021	16	0.001	12	0	29	0	29
119			min	-0.037	11	-0.227	22	-0.021	9	-0.001	17	0	1	0	1
120	M47	I	max	0.05	11	0.227	22	0.021	17	0.001	22	0	29	0	29
121			min	-0.023	14	-0.084	19	-0.021	8	0	19	0	1	0	1
122		J	max	0.01	17	0.084	19	0.021	16	0.001	22	0	29	0	29
123			min	-0.075	12	-0.227	22	-0.021	9	0	19	0	1	0	1
124	M48	I	max	1.042	18	0.665	18	0.03	9	0.033	9	0	29	0	29
125			min	-1.006	19	-0.568	19	-0.03	8	-0.028	16	0	1	0	1
126		J	max	0.749	19	0.274	18	0.011	16	0.015	13	0	29	0	29
127			min	-0.985	18	-0.253	19	-0.011	17	-0.001	16	0	1	0	1
128	M49	I	max	0.053	11	0.227	22	0.021	17	0	22	0	29	0	29
129			min	-0.022	14	-0.084	19	-0.021	8	0	19	0	1	0	1
130		J	max	0.005	19	0.084	19	0.021	16	0	22	0	29	0	29
131			min	-0.065	3	-0.227	22	-0.021	9	0	19	0	1	0	1
132	M50	I	max	0.075	11	0.227	22	0.021	17	0	8	0	29	0	29
133			min	-0.017	14	-0.084	19	-0.021	8	0	9	0	1	0	1
134		J	max	0.006	14	0.084	19	0.021	16	0	8	0	29	0	29
135			min	-0.043	11	-0.227	22	-0.021	9	0	9	0	1	0	1
136	M51	I	max	0.053	11	0.227	22	0.021	17	0	19	0	29	0	29
137			min	-0.022	14	-0.084	19	-0.021	8	0	22	0	1	0	1
138		J	max	0.005	19	0.084	19	0.021	16	0	19	0	29	0	29
139			min	-0.065	3	-0.227	22	-0.021	9	0	22	0	1	0	1
140	M52	I	max	1.042	18	0.665	18	0.03	9	0.028	17	0	29	0	29
141			min	-1.006	19	-0.568	19	-0.03	8	-0.033	8	0	1	0	1
142		J	max	0.749	19	0.274	18	0.011	16	0.001	17	0	29	0	29
143			min	-0.985	18	-0.253	19	-0.011	17	-0.015	12	0	1	0	1
144	M53	I	max	0.05	11	0.227	22	0.021	17	0	19	0	29	0	29
145			min	-0.023	14	-0.084	19	-0.021	8	-0.001	22	0	1	0	1
146		J	max	0.01	16	0.084	19	0.021	16	0	19	0	29	0	29
147			min	-0.075	13	-0.227	22	-0.021	9	-0.001	22	0	1	0	1
148	M54	I	max	0.08	11	0.227	22	0.021	17	0.001	16	0	29	0	29
149			min	-0.015	14	-0.084	19	-0.021	8	-0.001	13	0	1	0	1
150		J	max	0.008	14	0.084	19	0.021	16	0.001	16	0	29	0	29
151			min	-0.037	11	-0.227	22	-0.021	9	-0.001	13	0	1	0	1
152	M55	I	max	0.57	18	0.377	18	0.017	9	0.053	13	0	29	0	29
153			min	-0.567	19	-0.314	19	-0.018	8	-0.036	16	0	1	0	1
154		J	max	0.398	19	0.149	18	0.008	18	0.042	13	0	29	0	29
155			min	-0.57	18	-0.134	19	-0.009	19	-0.017	16	0	1	0	1
156	M56	I	max	0.866	19	0.005	7	0	29	0.049	16	0	29	0	29
157			min	-0.86	18	0	2	0	1	-0.054	9	0	1	0	1
158		J	max	0.876	19	0	2	0	29	0.049	16	0	29	0	29
159			min	-0.85	18	-0.005	6	0	1	-0.054	9	0	1	0	1
160	M57	I	max	1.515	19	0.005	7	0	29	0.068	16	0	29	0	29
161			min	-1.534	18	0	2	0	1	-0.071	9	0	1	0	1
162		J	max	1.525	19	0	2	0	29	0.068	16	0	29	0	29
163			min	-1.524	18	-0.005	6	0	1	-0.071	9	0	1	0	1
164	M58	I	max	0.866	19	0.005	6	0	29	0.054	8	0	29	0	29
165			min	-0.86	18	0	2	0	1	-0.049	17	0	1	0	1
166		J	max	0.876	19	0	2	0	29	0.054	8	0	29	0	29

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
167			min	-0.85	18	-0.005	9	0	1	-0.049	17	0	1	0	1
168	M59	I	max	0.682	18	0.005	9	0	29	0.055	18	0	29	0	29
169			min	-0.48	19	0	2	0	1	-0.052	19	0	1	0	1
170		J	max	0.688	18	0	2	0	29	0.055	18	0	29	0	29
171			min	-0.474	19	-0.005	7	0	1	-0.052	19	0	1	0	1
172	M60	I	max	0.36	11	0.005	7	0	29	0.024	18	0	29	0	29
173			min	-0.043	14	0	2	0	1	-0.029	19	0	1	0	1
174		J	max	0.372	11	0	2	0	29	0.024	18	0	29	0	29
175			min	-0.036	14	-0.005	8	0	1	-0.029	19	0	1	0	1
176	M61	I	max	0.32	18	0.005	7	0	29	0.067	18	0	29	0	29
177			min	-0.289	19	0	2	0	1	-0.059	19	0	1	0	1
178		J	max	0.326	18	0	2	0	29	0.067	18	0	29	0	29
179			min	-0.283	19	-0.005	8	0	1	-0.059	19	0	1	0	1
180	M62	I	max	0.596	18	0.005	7	0	29	0.029	19	0	29	0	29
181			min	-0.538	19	0	2	0	1	-0.031	18	0	1	0	1
182		J	max	0.602	18	0	2	0	29	0.029	19	0	29	0	29
183			min	-0.532	19	-0.005	6	0	1	-0.031	18	0	1	0	1
184	M63	I	max	0.617	11	0.005	7	0	29	0.019	19	0	29	0	29
185			min	-0.136	14	0	2	0	1	-0.024	18	0	1	0	1
186		J	max	0.629	11	0	2	0	29	0.019	19	0	29	0	29
187			min	-0.129	14	-0.005	6	0	1	-0.024	18	0	1	0	1
188	M64	I	max	1.22	18	0.005	6	0	29	0.046	8	0	29	0	29
189			min	-0.932	19	0	2	0	1	-0.047	9	0	1	0	1
190		J	max	1.226	18	0	2	0	29	0.046	8	0	29	0	29
191			min	-0.926	19	-0.005	9	0	1	-0.047	9	0	1	0	1
192	M65	I	max	0.682	18	0.005	7	0	29	0.052	19	0	29	0	29
193			min	-0.48	19	0	2	0	1	-0.055	18	0	1	0	1
194		J	max	0.688	18	0	2	0	29	0.052	19	0	29	0	29
195			min	-0.474	19	-0.005	6	0	1	-0.055	18	0	1	0	1
196	M66	I	max	0.36	11	0.005	6	0	29	0.029	19	0	29	0	29
197			min	-0.043	14	0	2	0	1	-0.024	18	0	1	0	1
198		J	max	0.372	11	0	2	0	29	0.029	19	0	29	0	29
199			min	-0.036	14	-0.005	7	0	1	-0.024	18	0	1	0	1
200	M67	I	max	0.32	18	0.005	8	0	29	0.059	19	0	29	0	29
201			min	-0.289	19	0	2	0	1	-0.067	18	0	1	0	1
202		J	max	0.326	18	0	2	0	29	0.059	19	0	29	0	29
203			min	-0.283	19	-0.005	6	0	1	-0.067	18	0	1	0	1
204	M68	I	max	1.164	11	0.244	18	0.076	17	0	29	0	29	0	29
205			min	-0.03	14	-0.242	19	-0.086	8	0	1	0	1	0	1
206		J	max	0.793	18	0.709	19	0.249	8	0.008	9	0.027	16	0.004	14
207			min	-0.745	19	-0.714	18	-0.221	17	-0.007	16	-0.032	9	-0.016	11
208	M69	I	max	2.513	22	0.19	18	0.122	17	0	29	0	29	0	29
209			min	-0.751	19	-0.179	19	-0.134	8	0	1	0	1	0	1
210		J	max	0.059	19	0.733	19	0.566	8	0.005	17	0.043	12	0.066	18
211			min	-0.29	12	-0.779	18	-0.513	17	-0.011	12	-0.021	17	-0.063	19
212	M70	I	max	1.243	22	0.08	18	0.067	17	0	29	0	29	0	29
213			min	-0.301	19	-0.071	19	-0.073	8	0	1	0	1	0	1
214		J	max	0.149	19	0.356	19	0.352	8	0.005	18	0.015	19	0.012	11
215			min	-0.127	18	-0.404	18	-0.325	17	-0.004	19	-0.019	18	-0.001	14
216	M71	I	max	1.515	19	0.005	7	0	29	0.071	8	0	29	0	29
217			min	-1.534	18	0	2	0	1	-0.068	17	0	1	0	1
218		J	max	1.525	19	0	2	0	29	0.071	8	0	29	0	29
219			min	-1.524	18	-0.005	6	0	1	-0.068	17	0	1	0	1
220	M72	I	max	0.596	18	0.005	9	0	29	0.031	18	0	29	0	29
221			min	-0.538	19	0	2	0	1	-0.029	19	0	1	0	1

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
222		J	max	0.602	18	0	2	0	29	0.031	18	0	29	0	29
223			min	-0.532	19	-0.005	8	0	1	-0.029	19	0	1	0	1
224	M73	I	max	0.617	11	0.005	7	0	29	0.024	18	0	29	0	29
225			min	-0.136	14	0	2	0	1	-0.019	19	0	1	0	1
226		J	max	0.629	11	0	2	0	29	0.024	18	0	29	0	29
227			min	-0.129	14	-0.005	6	0	1	-0.019	19	0	1	0	1
228	M74	I	max	1.22	18	0.005	6	0	29	0.047	8	0	29	0	29
229			min	-0.932	19	0	2	0	1	-0.046	9	0	1	0	1
230		J	max	1.226	18	0	2	0	29	0.047	8	0	29	0	29
231			min	-0.926	19	-0.005	7	0	1	-0.046	9	0	1	0	1
232	M75	I	max	0.288	19	0.057	18	0.229	13	0.036	18	0	29	0	29
233			min	-1.084	13	-0.058	19	-0.185	16	-0.033	19	0	1	0	1
234		J	max	0.4	17	0.082	19	0.424	13	0.026	19	0	29	0	29
235			min	-0.53	12	-0.091	18	-0.235	16	-0.027	18	0	1	0	1
236	M76	I	max	0.073	11	0.227	22	0.021	17	0.001	22	0	29	0	29
237			min	-0.017	14	-0.084	19	-0.021	8	-0.001	19	0	1	0	1
238		J	max	0.018	17	0.084	19	0.021	16	0.001	22	0	29	0	29
239			min	-0.055	12	-0.227	22	-0.021	9	-0.001	19	0	1	0	1
240	M77	I	max	0.051	11	0.227	22	0.021	17	0	19	0	29	0	29
241			min	-0.007	14	-0.084	19	-0.021	8	-0.001	22	0	1	0	1
242		J	max	0.016	14	0.084	19	0.021	16	0	19	0	29	0	29
243			min	-0.067	11	-0.227	22	-0.021	9	-0.001	22	0	1	0	1
244	M78	I	max	0.047	11	0.227	22	0.021	17	0.001	13	0	29	0	29
245			min	-0.007	14	-0.084	19	-0.021	8	0	16	0	1	0	1
246		J	max	0.016	14	0.084	19	0.021	16	0.001	13	0	29	0	29
247			min	-0.071	11	-0.227	22	-0.021	9	0	16	0	1	0	1
248	M79	I	max	0.065	11	0.227	22	0.021	17	0.001	22	0	29	0	29
249			min	-0.005	14	-0.084	19	-0.021	8	0	19	0	1	0	1
250		J	max	0.018	14	0.084	19	0.021	16	0.001	22	0	29	0	29
251			min	-0.053	11	-0.227	22	-0.021	9	0	19	0	1	0	1
252	M80	I	max	0.028	14	0.073	18	0.019	9	0.035	13	0	29	0	29
253			min	-0.353	11	-0.08	19	-0.019	16	-0.028	16	0	1	0	1
254		J	max	0.432	19	0.148	18	0.022	8	0.019	18	0	29	0	29
255			min	-0.497	18	-0.218	11	-0.022	17	-0.015	19	0	1	0	1
256	M81	I	max	0.06	11	0.227	22	0.021	17	0	22	0	29	0	29
257			min	-0.006	14	-0.084	19	-0.021	8	0	19	0	1	0	1
258		J	max	0.017	14	0.084	19	0.021	16	0	22	0	29	0	29
259			min	-0.058	11	-0.227	22	-0.021	9	0	19	0	1	0	1
260	M82	I	max	0.048	11	0.227	22	0.021	17	0	9	0	29	0	29
261			min	-0.008	14	-0.084	19	-0.021	8	0	8	0	1	0	1
262		J	max	0.015	14	0.084	19	0.021	16	0	9	0	29	0	29
263			min	-0.07	11	-0.227	22	-0.021	9	0	8	0	1	0	1
264	M83	I	max	0.06	11	0.227	22	0.021	17	0	19	0	29	0	29
265			min	-0.006	14	-0.084	19	-0.021	8	0	22	0	1	0	1
266		J	max	0.017	14	0.084	19	0.021	16	0	19	0	29	0	29
267			min	-0.058	11	-0.227	22	-0.021	9	0	22	0	1	0	1
268	M84	I	max	0.028	14	0.073	18	0.019	17	0.028	17	0	29	0	29
269			min	-0.353	11	-0.08	19	-0.019	8	-0.035	12	0	1	0	1
270		J	max	0.432	19	0.148	18	0.022	16	0.015	19	0	29	0	29
271			min	-0.497	18	-0.218	11	-0.022	9	-0.019	18	0	1	0	1
272	M85	I	max	0.065	11	0.227	22	0.021	17	0	19	0	29	0	29
273			min	-0.005	14	-0.084	19	-0.021	8	-0.001	22	0	1	0	1
274		J	max	0.018	14	0.084	19	0.021	16	0	19	0	29	0	29
275			min	-0.053	11	-0.227	22	-0.021	9	-0.001	22	0	1	0	1
276	M86	I	max	0.047	11	0.227	22	0.021	17	0	17	0	29	0	29

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
277			min	-0.007	14	-0.084	19	-0.021	8	-0.001	12	0	1	0	1
278		J	max	0.016	14	0.084	19	0.021	16	0	17	0	29	0	29
279			min	-0.071	11	-0.227	22	-0.021	9	-0.001	12	0	1	0	1
280	M87	I	max	-0.008	14	0.029	18	0.008	9	0.042	13	0	29	0	29
281			min	-0.202	11	-0.035	19	-0.008	16	-0.011	16	0	1	0	1
282		J	max	0.231	19	0.077	18	0.012	8	0.025	11	0	29	0	29
283			min	-0.268	18	-0.128	19	-0.012	17	-0.01	14	0	1	0	1
284	M88	I	max	-0.008	14	0.029	18	0.008	17	0.011	17	0	29	0	29
285			min	-0.202	11	-0.035	19	-0.008	8	-0.042	12	0	1	0	1
286		J	max	0.231	19	0.077	18	0.012	16	0.01	14	0	29	0	29
287			min	-0.268	18	-0.128	19	-0.012	9	-0.025	11	0	1	0	1
288	M89	I	max	0.051	11	0.227	22	0.021	17	0.001	22	0	29	0	29
289			min	-0.007	14	-0.084	19	-0.021	8	0	19	0	1	0	1
290		J	max	0.016	14	0.084	19	0.021	16	0.001	22	0	29	0	29
291			min	-0.067	11	-0.227	22	-0.021	9	0	19	0	1	0	1
292	M90	I	max	0.091	19	0.072	18	0.098	13	0.029	18	0	29	0	29
293			min	-0.424	22	-0.068	19	-0.041	16	-0.028	19	0	1	0	1
294		J	max	0.091	19	0.068	19	0.041	17	0.028	19	0	29	0	29
295			min	-0.424	22	-0.072	18	-0.098	12	-0.029	18	0	1	0	1
296	M91	I	max	0.253	19	0.061	18	0.199	13	0.03	18	0	29	0	29
297			min	-0.856	22	-0.064	19	-0.08	16	-0.029	19	0	1	0	1
298		J	max	0.253	19	0.064	19	0.08	17	0.029	19	0	29	0	29
299			min	-0.856	22	-0.061	18	-0.199	12	-0.03	18	0	1	0	1
300	M92	I	max	0.117	19	0.06	18	0.119	13	0.01	18	0	29	0	29
301			min	-0.466	22	-0.059	19	-0.046	16	-0.009	19	0	1	0	1
302		J	max	0.117	19	0.059	19	0.046	17	0.009	19	0	29	0	29
303			min	-0.466	22	-0.06	18	-0.119	12	-0.01	18	0	1	0	1
304	M93	I	max	0.461	13	0.005	9	0	29	0.048	9	0	29	0	29
305			min	-0.303	16	0	2	0	1	-0.04	18	0	1	0	1
306		J	max	0.452	13	0	2	0	29	0.048	9	0	29	0	29
307			min	-0.309	16	-0.005	6	0	1	-0.04	18	0	1	0	1
308	M94	I	max	0.833	12	0.005	9	0	29	0.031	17	0	29	0	29
309			min	-0.168	19	0	2	0	1	-0.035	8	0	1	0	1
310		J	max	0.824	12	0	2	0	29	0.031	17	0	29	0	29
311			min	-0.176	19	-0.005	6	0	1	-0.035	8	0	1	0	1
312	M95	I	max	0.646	22	0.005	9	0	29	0.04	19	0	29	0	29
313			min	-0.147	19	0	2	0	1	-0.041	18	0	1	0	1
314		J	max	0.638	22	0	2	0	29	0.04	19	0	29	0	29
315			min	-0.155	19	-0.005	6	0	1	-0.041	18	0	1	0	1
316	M96	I	max	0.646	22	0.005	9	0	29	0.041	18	0	29	0	29
317			min	-0.147	19	0	2	0	1	-0.04	19	0	1	0	1
318		J	max	0.638	22	0	2	0	29	0.041	18	0	29	0	29
319			min	-0.155	19	-0.005	6	0	1	-0.04	19	0	1	0	1
320	M97	I	max	0.833	13	0.005	9	0	29	0.035	9	0	29	0	29
321			min	-0.168	19	0	2	0	1	-0.031	16	0	1	0	1
322		J	max	0.824	13	0	2	0	29	0.035	9	0	29	0	29
323			min	-0.176	19	-0.005	6	0	1	-0.031	16	0	1	0	1
324	M98	I	max	0.461	12	0.005	9	0	29	0.04	18	0	29	0	29
325			min	-0.303	17	0	2	0	1	-0.048	8	0	1	0	1
326		J	max	0.452	12	0	2	0	29	0.04	18	0	29	0	29
327			min	-0.309	17	-0.005	6	0	1	-0.048	8	0	1	0	1
328	M99	I	max	0.91	13	0.005	9	0	29	0.083	19	0	29	0	29
329			min	-0.68	16	0	2	0	1	-0.09	18	0	1	0	1
330		J	max	0.901	13	0	2	0	29	0.083	19	0	29	0	29
331			min	-0.686	16	-0.005	6	0	1	-0.09	18	0	1	0	1

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
332	M100	I	max	1.628	12	0.005	9	0	29	0.022	9	0	29	0	29
333			min	-0.426	19	0	2	0	1	-0.021	8	0	1	0	1
334		J	max	1.618	12	0	2	0	29	0.022	9	0	29	0	29
335			min	-0.434	19	-0.005	6	0	1	-0.021	8	0	1	0	1
336	M101	I	max	1.258	22	0.005	9	0	29	0.042	19	0	29	0	29
337			min	-0.366	19	0	2	0	1	-0.043	18	0	1	0	1
338		J	max	1.249	22	0	2	0	29	0.042	19	0	29	0	29
339			min	-0.374	19	-0.005	6	0	1	-0.043	18	0	1	0	1
340	M102	I	max	1.258	22	0.005	9	0	29	0.043	18	0	29	0	29
341			min	-0.366	19	0	2	0	1	-0.042	19	0	1	0	1
342		J	max	1.249	22	0	2	0	29	0.043	18	0	29	0	29
343			min	-0.374	19	-0.005	6	0	1	-0.042	19	0	1	0	1
344	M103	I	max	1.628	13	0.005	9	0	29	0.021	9	0	29	0	29
345			min	-0.426	19	0	2	0	1	-0.022	8	0	1	0	1
346		J	max	1.618	13	0	2	0	29	0.021	9	0	29	0	29
347			min	-0.434	19	-0.005	6	0	1	-0.022	8	0	1	0	1
348	M104	I	max	0.91	12	0.005	9	0	29	0.09	18	0	29	0	29
349			min	-0.68	17	0	2	0	1	-0.083	19	0	1	0	1
350		J	max	0.901	12	0	2	0	29	0.09	18	0	29	0	29
351			min	-0.686	17	-0.005	6	0	1	-0.083	19	0	1	0	1
352	M105	I	max	0.548	9	0.005	9	0	29	0.055	19	0	29	0	29
353			min	-0.453	16	0	2	0	1	-0.059	18	0	1	0	1
354		J	max	0.538	9	0	2	0	29	0.055	19	0	29	0	29
355			min	-0.459	16	-0.005	6	0	1	-0.059	18	0	1	0	1
356	M106	I	max	0.92	12	0.005	9	0	29	0.018	19	0	29	0	29
357			min	-0.258	17	0	2	0	1	-0.019	18	0	1	0	1
358		J	max	0.911	12	0	2	0	29	0.018	19	0	29	0	29
359			min	-0.264	17	-0.005	6	0	1	-0.019	18	0	1	0	1
360	M107	I	max	0.678	13	0.005	9	0	29	0.013	19	0	29	0	29
361			min	-0.151	19	0	2	0	1	-0.014	18	0	1	0	1
362		J	max	0.668	13	0	2	0	29	0.013	19	0	29	0	29
363			min	-0.159	19	-0.005	6	0	1	-0.014	18	0	1	0	1
364	M108	I	max	0.678	12	0.005	9	0	29	0.014	18	0	29	0	29
365			min	-0.151	19	0	2	0	1	-0.013	19	0	1	0	1
366		J	max	0.668	12	0	2	0	29	0.014	18	0	29	0	29
367			min	-0.159	19	-0.005	6	0	1	-0.013	19	0	1	0	1
368	M109	I	max	0.92	13	0.005	9	0	29	0.019	18	0	29	0	29
369			min	-0.258	16	0	2	0	1	-0.018	19	0	1	0	1
370		J	max	0.911	13	0	2	0	29	0.019	18	0	29	0	29
371			min	-0.264	16	-0.005	6	0	1	-0.018	19	0	1	0	1
372	M110	I	max	0.548	8	0.005	9	0	29	0.059	18	0	29	0	29
373			min	-0.453	17	0	2	0	1	-0.055	19	0	1	0	1
374		J	max	0.538	8	0	2	0	29	0.059	18	0	29	0	29
375			min	-0.459	17	-0.005	6	0	1	-0.055	19	0	1	0	1
376	M113	I	max	0.7	9	0.005	9	0	29	0.036	19	0	29	0	29
377			min	-0.596	16	0	2	0	1	-0.044	18	0	1	0	1
378		J	max	0.691	9	0	2	0	29	0.036	19	0	29	0	29
379			min	-0.602	16	-0.005	6	0	1	-0.044	18	0	1	0	1
380	M115	I	max	0.551	13	0.005	9	0	29	0.029	19	0	29	0	29
381			min	-0.366	16	0	2	0	1	-0.024	18	0	1	0	1
382		J	max	0.542	13	0	2	0	29	0.029	19	0	29	0	29
383			min	-0.371	16	-0.005	6	0	1	-0.024	18	0	1	0	1
384	M116	I	max	0.551	12	0.005	9	0	29	0.024	18	0	29	0	29
385			min	-0.366	17	0	2	0	1	-0.029	19	0	1	0	1
386		J	max	0.542	12	0	2	0	29	0.024	18	0	29	0	29

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
387			min	-0.371	17	-0.005	6	0	1	-0.029	19	0	1	0	1
388	M111	I	max	0.7	8	0.005	9	0	29	0.044	18	0	29	0	29
389			min	-0.596	17	0	2	0	1	-0.036	19	0	1	0	1
390		J	max	0.691	8	0	2	0	29	0.044	18	0	29	0	29
391			min	-0.602	17	-0.005	6	0	1	-0.036	19	0	1	0	1
392	M117	I	max	0.101	11	0.343	22	0.032	17	0	16	0	29	0	29
393			min	-0.016	14	-0.13	19	-0.032	8	0	9	0	1	0	1
394		J	max	0.011	14	0.13	19	0.032	16	0	16	0	29	0	29
395			min	-0.119	11	-0.343	22	-0.032	9	0	9	0	1	0	1
396	M118	I	max	0.116	11	0.343	22	0.032	17	0	16	0	29	0	29
397			min	-0.013	14	-0.13	19	-0.032	8	0	9	0	1	0	1
398		J	max	0.014	14	0.13	19	0.032	16	0	16	0	29	0	29
399			min	-0.104	11	-0.343	22	-0.032	9	0	9	0	1	0	1
400	M119	I	max	1.85	3	0.226	18	0.115	9	0	29	0	29	0	29
401			min	-0.045	19	-0.256	19	-0.115	8	0	1	0	1	0	1
402		J	max	0.51	18	0.724	19	0.439	8	0.029	9	0.228	8	0.027	19
403			min	-0.595	19	-0.62	18	-0.439	9	-0.029	8	-0.228	9	-0.084	22
404	M120	I	max	1.359	13	0.005	9	0	29	0.041	19	0	29	0	29
405			min	-0.358	19	0	2	0	1	-0.035	18	0	1	0	1
406		J	max	1.349	13	0	2	0	29	0.041	19	0	29	0	29
407			min	-0.366	19	-0.005	6	0	1	-0.035	18	0	1	0	1
408	M121	I	max	2.187	22	0.179	18	0.101	9	0	29	0	29	0	29
409			min	-0.686	19	-0.136	19	-0.101	8	0	1	0	1	0	1
410		J	max	0.02	14	0.704	19	0.69	8	0.007	9	0.339	8	0.123	18
411			min	-0.141	3	-0.931	18	-0.69	9	-0.007	8	-0.339	9	-0.079	19
412	M122	I	max	1.546	13	0.005	9	0	29	0.023	19	0	29	0	29
413			min	-0.369	19	0	2	0	1	-0.034	18	0	1	0	1
414		J	max	1.536	13	0	2	0	29	0.023	19	0	29	0	29
415			min	-0.377	19	-0.005	6	0	1	-0.034	18	0	1	0	1
416	M123	I	max	1.359	12	0.005	9	0	29	0.035	18	0	29	0	29
417			min	-0.358	19	0	2	0	1	-0.041	19	0	1	0	1
418		J	max	1.349	12	0	2	0	29	0.035	18	0	29	0	29
419			min	-0.366	19	-0.005	6	0	1	-0.041	19	0	1	0	1
420	M124	I	max	1.546	12	0.005	9	0	29	0.034	18	0	29	0	29
421			min	-0.369	19	0	2	0	1	-0.023	19	0	1	0	1
422		J	max	1.536	12	0	2	0	29	0.034	18	0	29	0	29
423			min	-0.377	19	-0.005	6	0	1	-0.023	19	0	1	0	1
424	M112	I	max	0.858	18	0.007	7	0	29	0.063	18	0	29	0	29
425			min	-0.651	19	0	2	0	1	-0.056	19	0	1	0	1
426		J	max	0.854	18	0	2	0	29	0.063	18	0	29	0	29
427			min	-0.655	19	-0.007	6	0	1	-0.056	19	0	1	0	1
428	M114	I	max	1.154	18	0.007	7	0	29	0.027	8	0	29	0	29
429			min	-0.889	19	0	2	0	1	-0.027	9	0	1	0	1
430		J	max	1.15	18	0	2	0	29	0.027	8	0	29	0	29
431			min	-0.893	19	-0.007	9	0	1	-0.027	9	0	1	0	1
432	M125	I	max	0.858	18	0.007	8	0	29	0.056	19	0	29	0	29
433			min	-0.651	19	0	2	0	1	-0.063	18	0	1	0	1
434		J	max	0.854	18	0	2	0	29	0.056	19	0	29	0	29
435			min	-0.655	19	-0.007	7	0	1	-0.063	18	0	1	0	1
436	M126	I	max	1.215	19	0.007	9	0	29	0.04	8	0	29	0	29
437			min	-1.097	18	0	2	0	1	-0.033	17	0	1	0	1
438		J	max	1.203	19	0	2	0	29	0.04	8	0	29	0	29
439			min	-1.109	18	-0.007	6	0	1	-0.033	17	0	1	0	1
440	M127	I	max	1.392	19	0.007	9	0	29	0.051	8	0	29	0	29
441			min	-1.182	18	0	2	0	1	-0.051	9	0	1	0	1

Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
442		J	max	1.38	19	0	2	0	29	0.051	8	0	29	0	29
443			min	-1.194	18	-0.007	6	0	1	-0.051	9	0	1	0	1
444	M128	I	max	1.215	19	0.007	9	0	29	0.033	16	0	29	0	29
445			min	-1.097	18	0	2	0	1	-0.04	9	0	1	0	1
446		J	max	1.203	19	0	2	0	29	0.033	16	0	29	0	29
447			min	-1.109	18	-0.007	6	0	1	-0.04	9	0	1	0	1

Node Reactions

No Data to Print...

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	D	Yes	Y	1	1								
2	L	Yes	Y			2	1						
3	D + L	Yes	Y	1	1	2	1						
4	D + 0.75L	Yes	Y	1	1	2	0.75						
5			Y										
6	(1.0+0.14Sds)D + 0.7Ex	Yes	Y	1	1.214			3	0.7				
7	(1.0+0.14Sds)D - 0.7Ex	Yes	Y	1	1.214			3	-0.7				
8	(1.0+0.14Sds)D + 0.7Ez	Yes	Y	1	1.214					4	0.7		
9	(1.0+0.14Sds)D - 0.7Ez	Yes	Y	1	1.214					4	-0.7		
10	(1.0+0.105Sds)D + 0.525Ex + 0.75L	Yes	Y	1	1.16	2	0.75	3	0.525				
11	(1.0+0.105Sds)D - 0.525Ex + 0.75L	Yes	Y	1	1.16	2	0.75	3	-0.525				
12	(1.0+0.105Sds)D + 0.525Ez + 0.75L	Yes	Y	1	1.16	2	0.75			4	0.525		
13	(1.0+0.105Sds)D - 0.525Ez + 0.75L	Yes	Y	1	1.16	2	0.75			4	-0.525		
14	(0.9-0.14Sds)D + 0.7Ex	Yes	Y	1	0.686			3	0.7				
15	(0.9-0.14Sds)D - 0.7Ex	Yes	Y	1	0.686			3	-0.7				
16	(0.9-0.14Sds)D + 0.7Ez	Yes	Y	1	0.686					4	0.7		
17	(0.9-0.14Sds)D - 0.7Ez	Yes	Y	1	0.686					4	-0.7		
18	D + 0.6Wx	Yes	Y	1	1					5	1		
19	D - 0.6Wx	Yes	Y	1	1					5	-1		
20	D + 0.6Wz	Yes	Y	1	1					6	1		
21	D - 0.6Wz	Yes	Y	1	1					6	-1		
22	D + 0.75L + 0.45Wx	Yes	Y	1	1	2	0.75			5	0.45		
23	D + 0.75L - 0.45Wx	Yes	Y	1	1	2	0.75			5	-0.45		
24	D + 0.75L + 0.45Wz	Yes	Y	1	1	2	0.75			6	0.45		
25	D + 0.75L - 0.45Wz	Yes	Y	1	1	2	0.75			6	-0.45		
26	0.6D + 0.6Wx	Yes	Y	1	0.6					5	0.6		
27	0.6D - 0.6Wx	Yes	Y	1	0.6					5	-0.6		
28	0.6D + 0.6Wz	Yes	Y	1	0.6					6	0.6		
29	0.6D - 0.6Wz	Yes	Y	1	0.6					6	-0.6		
30	(1.0+0.14Sds)D + 0.7OmEx		Y	1	1.214			3	1.05				
31	(1.0+0.14Sds)D - 0.7OmEx		Y	1	1.214			3	-1.05				
32	(1.0+0.14Sds)D + 0.7OmEz		Y	1	1.214					4	1.05		
33	(1.0+0.14Sds)D - 0.7OmEz		Y	1	1.214					4	-1.05		
34	(1.0+0.105Sds)D + 0.525OmEx + 0.75L		Y	1	1.16	2	0.75	3	0.787				
35	(1.0+0.105Sds)D - 0.525OmEx + 0.75L		Y	1	1.16	2	0.75	3	-0.787				
36	(1.0+0.105Sds)D + 0.525OmEz + 0.75L		Y	1	1.16	2	0.75			4	0.787		
37	(1.0+0.105Sds)D - 0.525OmEz + 0.75L		Y	1	1.16	2	0.75			4	-0.787		
38	(0.9-0.14Sds)D + 0.7OmEx		Y	1	0.686			3	1.05				
39	(0.9-0.14Sds)D - 0.7OmEx		Y	1	0.686			3	-1.05				
40	(0.9-0.14Sds)D + 0.7OmEz		Y	1	0.686					4	1.05		
41	(0.9-0.14Sds)D - 0.7OmEz		Y	1	0.686					4	-1.05		
42			Y										
43	1.4D		Y	1	1.4								
44	1.2D + 1.6L		Y	1	1.2	2	1.6						
45	(1.2+0.2Sds)D + Ex + 0.5L		Y	1	1.505	2	0.5	3	1				
46	(1.2+0.2Sds)D - Ex + 0.5L		Y	1	1.505	2	0.5	3	-1				
47	(1.2+0.2Sds)D + Ez + 0.5L		Y	1	1.505	2	0.5			4	1		
48	(1.2+0.2Sds)D - Ez + 0.5L		Y	1	1.505	2	0.5			4	-1		
49	(0.9-0.2Sds)D + Ex		Y	1	0.595			3	1				
50	(0.9-0.2Sds)D - Ex		Y	1	0.595			3	-1				
51	(0.9-0.2Sds)D + Ez		Y	1	0.595					4	1		
52	(0.9-0.2Sds)D - Ez		Y	1	0.595					4	-1		
53	1.2D + Wx + 0.5L		Y	1	1.2	2	0.5					5	1
54	1.2D - Wx + 0.5L		Y	1	1.2	2	0.5					5	-1
55	1.2D + Wz + 0.5L		Y	1	1.2	2	0.5					6	1

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
56	1.2D - Wz + 0.5L		Y	1	1.2	2	0.5					6	-1
57	0.9D + Wx		Y	1	0.9							5	1
58	0.9D - Wx		Y	1	0.9							5	-1
59	0.9D + Wz		Y	1	0.9							6	1
60	0.9D - Wz		Y	1	0.9							6	-1
61	(1.2+0.2Sds)D + OmEx + 0.5L	Yes	Y	1	1.505	2	0.5	3	1.5				
62	(1.2+0.2Sds)D - OmEx + 0.5L	Yes	Y	1	1.505	2	0.5	3	-1.5				
63	(1.2+0.2Sds)D + OmEz + 0.5L	Yes	Y	1	1.505	2	0.5			4	1.5		
64	(1.2+0.2Sds)D - OmEz + 0.5L	Yes	Y	1	1.505	2	0.5			4	-1.5		
65	(0.9-0.2Sds)D + OmEx	Yes	Y	1	0.595			3	1.5				
66	(0.9-0.2Sds)D - OmEx	Yes	Y	1	0.595			3	-1.5				
67	(0.9-0.2Sds)D + OmEz	Yes	Y	1	0.595					4	1.5		
68	(0.9-0.2Sds)D - OmEz	Yes	Y	1	0.595					4	-1.5		

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
0	N1	max	0.255	62	0.871	64	0.193	64	0	68	0	68	0	68
1		min	-0.216	65	-0.13	67	-0.15	67	0	1	0	1	0	1
2	N5	max	0.106	19	1.018	64	0.171	64	0	68	0	68	0	68
3		min	-0.142	61	-0.255	19	-0.158	67	0	1	0	1	0	1
4	N7	max	0.255	62	0.871	63	0.15	68	0	68	0	68	0	68
5		min	-0.216	65	-0.13	68	-0.193	63	0	1	0	1	0	1
6	N9	max	0.106	19	1.018	63	0.158	68	0	68	0	68	0	68
7		min	-0.142	61	-0.255	19	-0.171	63	0	1	0	1	0	1
8	N42	max	0.191	62	0.763	62	0.164	64	0	68	0	68	0	68
9		min	-0.183	65	-0.223	65	-0.124	67	0	1	0	1	0	1
10	N45	max	0.052	66	0.791	64	0.14	64	0	68	0	68	0	68
11		min	-0.057	61	-0.203	67	-0.124	67	0	1	0	1	0	1
12	N46	max	0.14	66	1.385	64	0.255	64	0	68	0	68	0	68
13		min	-0.14	61	-0.29	67	-0.217	67	0	1	0	1	0	1
14	N48	max	0.349	62	1.534	62	0.183	64	0	68	0	68	0	68
15		min	-0.342	65	-0.393	65	-0.166	67	0	1	0	1	0	1
16	N50	max	0.25	66	2.513	22	0.275	64	0	68	0	68	0	68
17		min	-0.245	65	-0.751	19	-0.265	67	0	1	0	1	0	1
18	N53	max	0.094	66	1.243	22	0.151	64	0	68	0	68	0	68
19		min	-0.1	61	-0.301	19	-0.146	67	0	1	0	1	0	1
20	N54	max	0.191	62	0.763	62	0.124	68	0	68	0	68	0	68
21		min	-0.183	65	-0.223	65	-0.164	63	0	1	0	1	0	1
22	N56	max	0.14	66	1.385	63	0.217	68	0	68	0	68	0	68
23		min	-0.14	61	-0.29	68	-0.255	63	0	1	0	1	0	1
24	N59	max	0.052	66	0.791	63	0.124	68	0	68	0	68	0	68
25		min	-0.057	61	-0.203	68	-0.14	63	0	1	0	1	0	1
26	N110	max	0.349	62	1.534	62	0.166	68	0	68	0	68	0	68
27		min	-0.342	65	-0.393	65	-0.183	63	0	1	0	1	0	1
28	N111	max	0.25	66	2.513	22	0.265	68	0	68	0	68	0	68
29		min	-0.245	65	-0.751	19	-0.275	63	0	1	0	1	0	1
30	N112	max	0.094	66	1.243	22	0.146	68	0	68	0	68	0	68
31		min	-0.1	61	-0.301	19	-0.151	63	0	1	0	1	0	1
32	N128	max	0.333	62	1.87	62	0.243	68	0	68	0	68	0	68
33		min	-0.276	65	-0.045	19	-0.243	67	0	1	0	1	0	1
34	N130	max	0.14	19	2.187	22	0.211	68	0	68	0	68	0	68
35		min	-0.173	61	-0.686	19	-0.211	67	0	1	0	1	0	1
36	Totals:	max	3.199	66	19.98	22	3.199	68						
37		min	-3.199	65	-2.356	19	-3.199	67						

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: RAFTER.ec6

DESCRIPTION: --None--

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

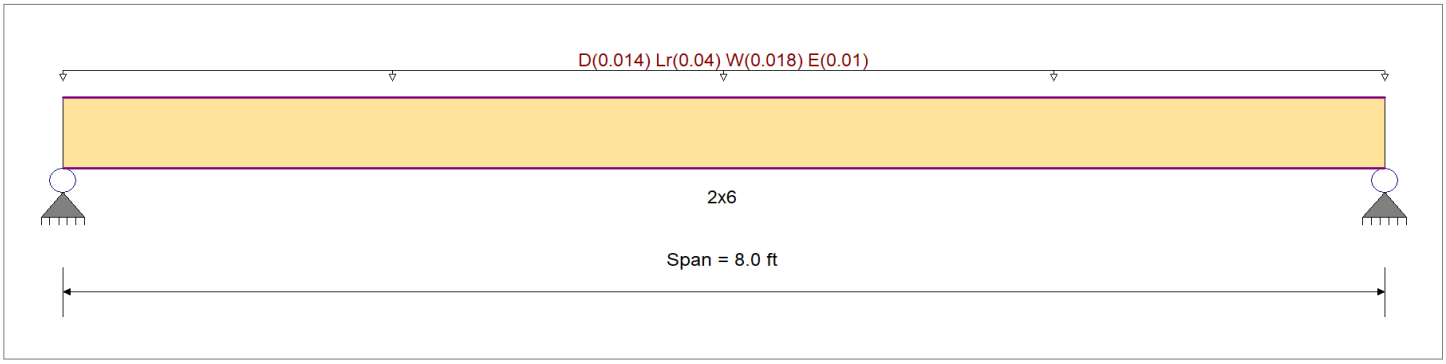
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	IBC 2021
Wood Species :	Douglas Fir-Larch (North)
Wood Grade :	No. 1/No. 2
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling

Fb +	850.0 psi
Fb -	850.0 psi
Fc - Prll	1,400.0 psi
Fc - Perp	625.0 psi
Fv	180.0 psi
Ft	500.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	30.590 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0070, Lr = 0.020, W = 0.0090, E = 0.0050 ksf, Tributary Width = 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.512 : 1	Maximum Shear Stress Ratio	=	0.160 : 1
Section used for this span		2x6	Section used for this span		2x6
fb: Actual	=	707.73 psi	fv: Actual	=	36.11 psi
F'b	=	1,381.25 psi	F'v	=	225.00 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	7.562 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.111 in	Ratio =	861 >=360	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.155 in	Ratio =	618 >=180	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.201	0.063	0.90	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.13	200.0	994.5	0.06	10.2	162.0
+D+Lr					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.512	0.160	1.25	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.45	707.7	1,381.3	0.20	36.1	225.0
+D+0.750Lr					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.420	0.132	1.25	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.37	580.8	1,381.3	0.16	29.6	225.0
+D+0.60W					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.191	0.060	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.21	337.1	1,768.0	0.09	17.2	288.0
+D+0.70E					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.163	0.051	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.18	288.8	1,768.0	0.08	14.7	288.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: RAFTER.ec6

DESCRIPTION: --None--

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750Lr+0.450W					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	**1**	0.387	0.121	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.43	683.6	1,768.0	0.19	34.9	288.0
+D+0.450W					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	**1**	0.171	0.054	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.19	302.8	1,768.0	0.08	15.4	288.0
+D+0.5250E					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	**1**	0.151	0.047	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.17	266.6	1,768.0	0.07	13.6	288.0
+0.60D+0.60W					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	**1**	0.145	0.046	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.16	257.1	1,768.0	0.07	13.1	288.0
+0.60D+0.70E					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	**1**	0.118	0.037	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.13	208.8	1,768.0	0.06	10.7	288.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.1553	4.029		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.223	0.223
Max Upward from Load Combinations	0.223	0.223
Max Upward from Load Cases	0.160	0.160
D Only	0.063	0.063
+D+Lr	0.223	0.223
+D+0.750Lr	0.183	0.183
+D+0.60W	0.106	0.106
+D+0.70E	0.091	0.091
+D+0.750Lr+0.450W	0.215	0.215
+D+0.450W	0.095	0.095
+D+0.5250E	0.084	0.084
+0.60D+0.60W	0.081	0.081
+0.60D+0.70E	0.066	0.066
Lr Only	0.160	0.160
W Only	0.072	0.072
E Only	0.040	0.040

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